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CITY OF CERES

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SAFETY ELEMENT

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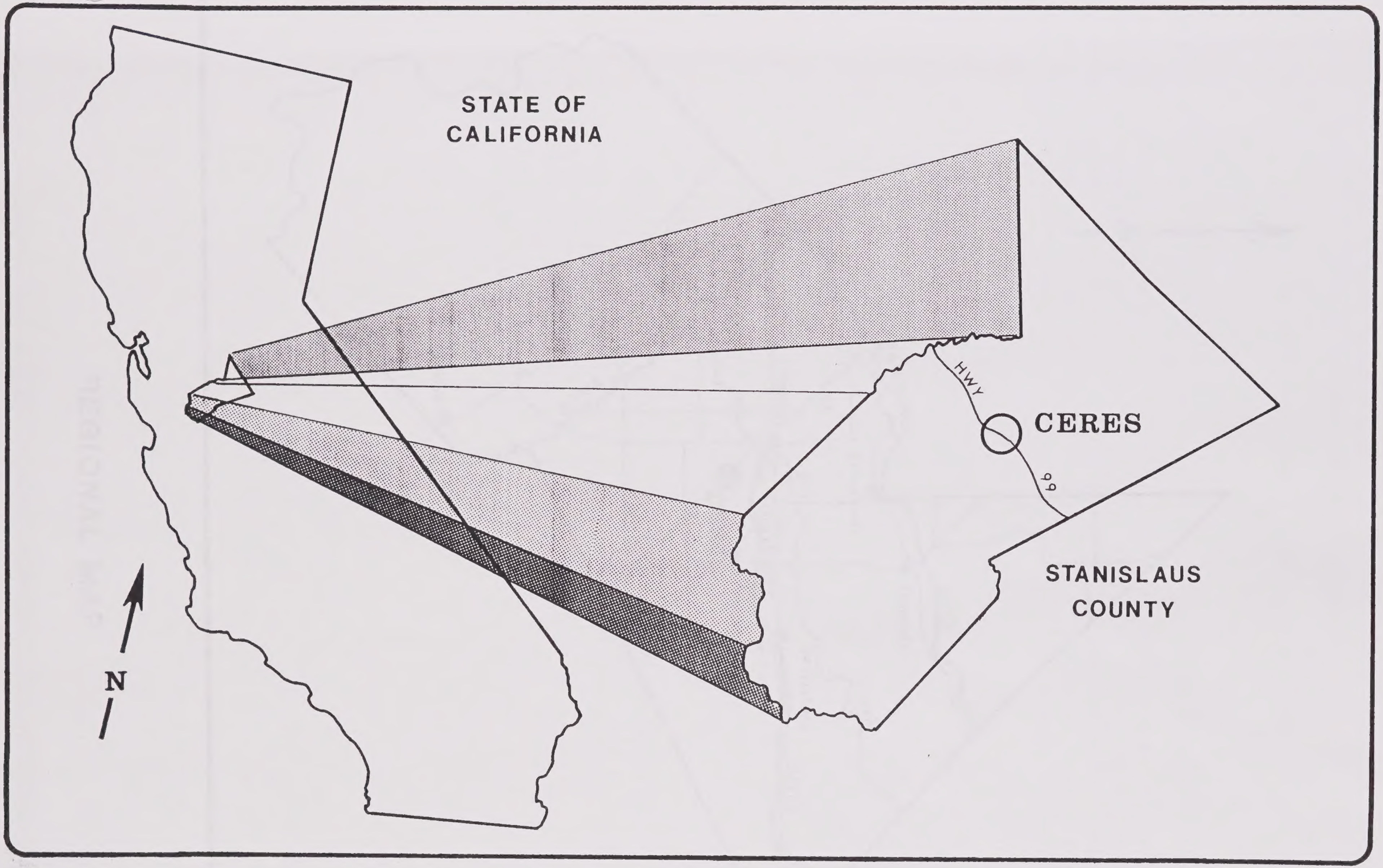
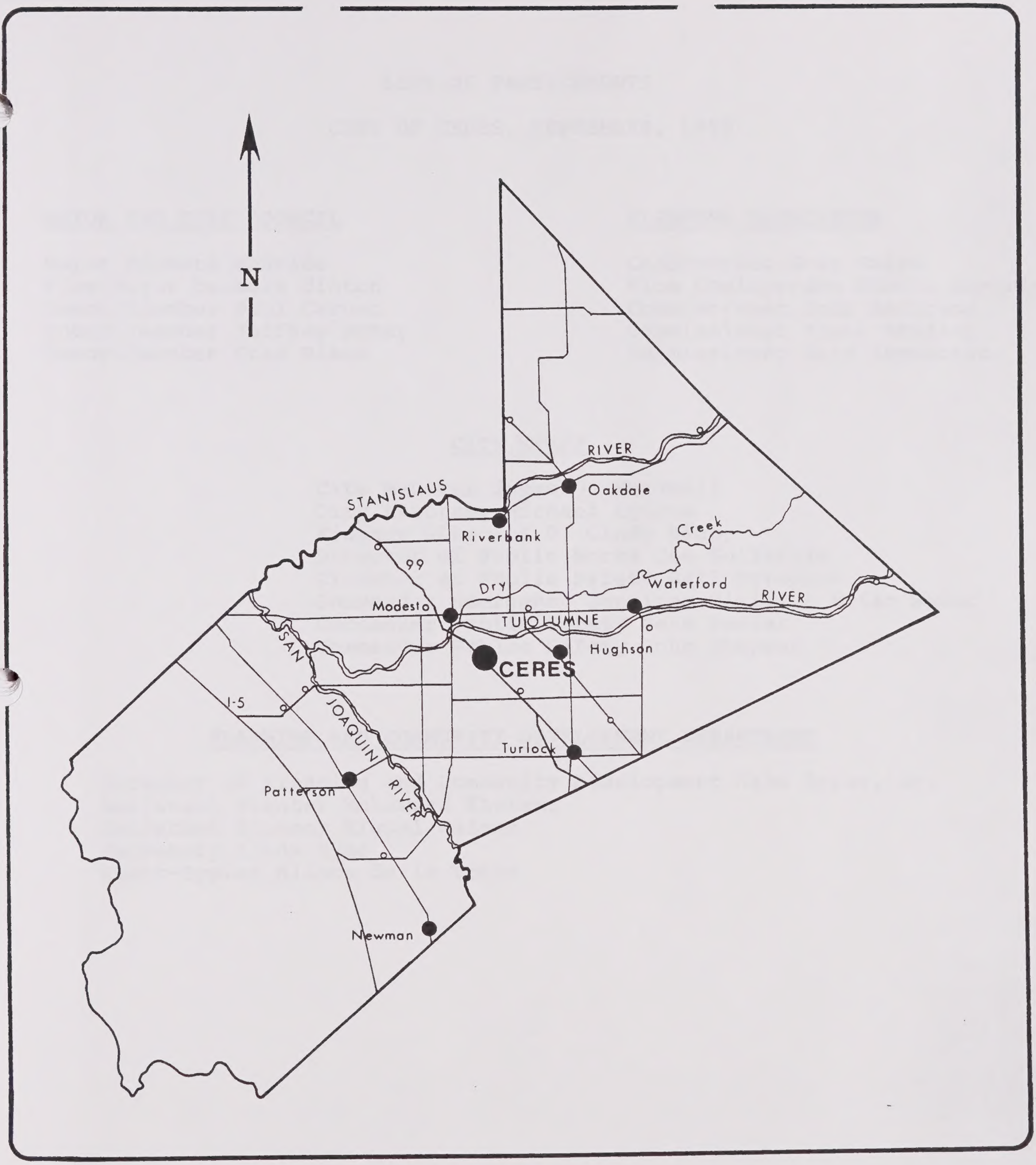


CITY OF CERES

LOCATION MAP



REGIONAL MAP

LIST OF PARTICIPANTS

CITY OF CERES, SEPTEMBER, 1990

MAYOR AND CITY COUNCIL

Mayor Richard McBride
Vice Mayor Barbara Hinton
Councilmember Paul Caruso
Councilmember Jeffrey McKay
Councilmember Stan Risen

PLANNING COMMISSION

Chairperson Greg Smith
Vice Chairperson Sheila Marable
Commissioner John Anderson
Commissioner Blair Bradley
Commissioner Eric Ingwerson

CITY STAFF

City Manager James G. Marshall
City Attorney Michael Lyions
Finance Director D. Cindy Higby
Director of Public Works Joe Hollstein
Director of Public Safety Gail Peterson
Commander Emergency Services Division Brian Weber
Commander Public Safety Gene Fowler
Commander Public Safety John Chapman

PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT

Director of Planning and Community Development Jake Raper, Jr.
Assistant Planner Mohammad Khatami
Assistant Planner Miguel Galvez
Secretary Linda Ryno
Clerk-Typist Blanca de la Torre

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SAFETY ELEMENT

I. INTRODUCTION

Planning is a process for making informed decisions about the future. It includes analyzing existing social and environmental conditions, issues and data. It involves the formulation and adoption of goals, policies, and programs to enhance the quality of life of community.

A. Background

The safety and seismic safety elements joined the state statutes in 1971. The safety element was required partly in reaction to devastating wildland fires in September and October 1970. The San Fernando earthquake was largely responsible for prompting the Legislature to pass the requirement for a seismic safety element.

In 1984, AB 2038 (Chapter 1009) consolidated the seismic safety element requirements with those of the safety element and deleted the requirement for adoption of a separate seismic safety element and safety elements.

B. Purpose

The safety element aims at reducing death, injuries, property damage, and the economic and social dislocation resulting from natural hazards including: flooding; mudslides and soil creep; tsunamis and seiches; land subsidence; earthquakes; avalanches; other geologic phenomena; levee or dam failure; certain types of urban and wildland fires; and building collapse.

The safety element is the primary vehicle for identifying hazards that cities and counties must consider when making land use decisions. While the safety element focuses on identifying fire and geologic hazards, it may also address other locally relevant safety issues such as vehicle accidents, hazardous materials spills, power failure, and storm drainage.

The state has established a standard list of term definitions for local governments to use in assessing all potential hazards (see Appendix A).

II. SAFETY GOALS AND POLICIES

Goal 1

To prevent and reduce the loss of life, injury or damage to property resulting from fire.

Policy 1

Enforce fire standards and regulations in the course of reviewing building plans and conducting building inspections.

Policy 2

In addition to City Standards, building heights will not exceed the Emergency Services Division's equipment capabilities.

Policy 3

Where wildland areas are adjacent to urban development, the City shall encourage programs for the prevention of fuel build-up.

Policy 4

The Emergency Services Division shall evaluate all uses locating in or adjacent to wildland areas, both in terms of their vulnerability to fire hazard and in terms of their potential as a source of fire.

Policy 5

The City shall ensure that its ordinances, resolutions and policies relating to urban development are consistent with the requirements of acceptable fire safety.

Policy 6

The City shall maintain a water supply system that is adequate for fire protection purposes.

Policy 7

The City shall continue to maintain an efficient paid and volunteer fire department.

Policy 8

The City shall support local, state, and federal programs designed to inform and educate the public concerning fire prevention and suppression.

Goal II

To provide adequate access for fighting and other emergency equipment.

Policy 1

The City of Ceres will ensure in approving and construction new roads and streets that they are adequate in terms of width and turning radius to facilitate access by firefighting apparatus.

Policy 2

The City of Ceres shall maintain adequate space between buildings through the zoning ordinance and building code to provide for fire safety.

Goal III

To assess storm flow flooding conditions that can pose significant hazards to life and property and to develop policies and standards to assure the protection of the public health, safety and general welfare.

Policy 1

The City shall design and improve the storm drainage system to minimize public hazards.

Policy 2

Where appropriate, the construction of curbs and gutters shall be promoted as an important means of controlling local storm and nuisance waters.

Policy 3

New residential development, including mobile homes, shall be constructed above the 100 year flood level.

Policy 4

Development proposals for areas potentially subject to flooding or inundation will be accompanied by detailed hydrology studies and drainge plans when determined necessary by the City.

Goal IV

To provide safe buildings for people to occupy. To prevent the loss of lives, injury, and property damage due to the collapse of buildings.

Policy 1

The City should continue enforcing its current minimum requirement that all new buildings conform to state standards set forth in the most current edition of the Uniform Building Code.

Policy 2

Evaluate the need to develop and enact ordinances for the evaluation and abatement of structural hazards or deficiencies in existing and new structures which could result in structural failure in the event of an eartquake.

Goal V

To prevent the loss of lives, injury, and property damage due to the collapse of critical facilities and to prevent disruption of essential services.

Policy 1

The City should ensure that all public facilities, such as buildings, water tanks, and reservoirs, are structurally sound and able to withstand seismic shaking and the effects of seismically induced ground failure.

Goal VI

To recognize existing and potential seismic and geological hazards to the community and implement programs to reduce potential impacts.

Policy 1

Support continuing public awareness of hazards by providing citizens with hazard information, when appropriate, buyers of property shall be notified of geotechnical uncertainities or potential risks and costs.

Policy 2

Recognize the need to establish an abatement and rehabilitation program for designated unsafe buildings. This program to work in conjunction with redevelopment agency goals and policies.

Goal VII

Reduce the potential for loss of life and property in Ceres from airplane accidents.

Policy 1

Ensure proper planning around the Modesto City-County Airport in conjunction with the City of Ceres, to assure compatible land uses and adequate safety requirements.

Policy 2

Seek appointment for City of Ceres representatives to the Airport Advisory Committee.

Policy 3

Cooperate and participate in the Modesto-County Airport Land Use Plan Update.

Goal VIII

The City shall attempt to continue the funding of law enforcement services to maintain a high level of service, and expand that funding as necessary to keep pace with the needs of the City's growing population.

Policy 1

Maintain a police force with a minimum ratio of 1.6 to 2 sworn officers for each 1,000 residents, deployed so that, in an emergency situation, all areas of the City can be reached by police officers within five minutes.

Policy 2

The City shall study regional, state, and federal programs to determine where opportunities for law enforcement assistance can be utilized.

Policy 3

The City should explore the most effective and economical means of providing responsive and adequate law enforcement protection in the future.

Policy 4

The City shall continue to explore the availability of state and federal grants to off-set any required additions in law enforcement staffing and/or equipment.

Policy 5

To reduce the need for police protection during construction, on-site security should be provided for individual construction projects.

The Department of Public Safety should be provided with keys to all locks on construction site gates.

Goal IX

Reduce the risk and fear of crime through physical planning strategies that will maximize surveillance opportunities and minimize opportunities for crime found in the present and future built environment, and by creating and maintaining a high level of community awareness and support of crime prevention.

Policy 1

Law enforcement personnel should be involved in the development review process for all new development proposals.

Policy 2

Decisions involving crime prevention techniques in commercial and industrial properties should aid community surveillance and the patrol operations of law enforcement personnel.

Policy 3

The City shall promote the establishment of neighborhood watch programs to encourage community participation in the patrol of neighborhood areas, and increased awareness of any suspicious activity.

Policy 4

The City shall promote crime prevention programs for commercial and industrial areas.

Policy 5

Street lighting shall be required in urban residential, and in all commercial, and industrial areas to discourage crime.

Policy 6

Lighting shall be used for the purpose of providing illumination for the security and safety of on-site areas such as parking lots, loading, shipping and receiving, pathways and working areas, in accordance with the recommended lighting levels discussed in the following standards:

a) The design of light fixtures and their structural support shall be architecturally compatible with the surrounding buildings.
b) Walkway lighting fixtures shall have an overall height not exceeding 12 feet.
c) Security lighting fixtures are not to project above the fascia or roof line of the building.
d) All lighting is to be shielded to confine light spread within the site boundaries. Particular concern shall be for lighting adjacent to residential areas.

Policy 7

The City shall discourage crime through the incorporation of "defensible space" concepts into the design of dwellings and structures as follows:

Residential:

a) Well lighted and visible streets and street names, entrances, and house numbers.
b) Avoidance of "flag lots" wherever possible.
c) Well lighted and windowed apartment stairwells where possible.
d) Limitation of access into and between buildings so escape routes are fewer and undetected entrance is more difficult.
e) A visually well defined separation between public and private areas.
f) Placement of windows to allow easy resident surveillance of yards, corridors, entrances, parking aras, streets and other public and semi-public places.
g) Landscaping which permits surveillance of open areas and entryways, and does not create places for concealment.
h) Location of kitchen and living areas to facilitate surveillance.
i) Elimination of undefined hallways, particularly double-loaded corridors shared by large numbers of families. Entries and circulation corridors should be designed so that as few families as possible share a common lobby, facilitating the recognition of strangers.

Industrial and Commercial:

a) Landscaping, location of buildings and walls, etc. should facilitate surveillance from the street and from neighboring structures, and should not provide places for concealment.
b) The street system should allow emergency vehicle access fully around buildings to the full extent possible.
c) Parking and walkways should be located where surveillance from streets or an attendant is possible to reduce worker or customer isolation when walking to and from cars.
d) Access to buildings or building groups, and access between buildings should be limited so escape routes are fewer, and entrance into the building is made more difficult.
e) Access to roofs by pallets, flag poles, etc. should be eliminated or avoided.

Goal X

Promote land use patterns that reduce daily automotive trip distance for work, shopping, school, and recreation.

Policy 1

Locate new Neighborhood Commercial facilities within close proximity to the residential areas they serve.

Policy 2

Multi-Family Residential developments should be located in close proximity to Neighborhood Commercial Centers in order to encourage pedestrian instead of vehicular travel.

Policy 3

Neighborhood parks should be located in close proximity to the appropriate concentration of residents in order to encourage pedestrian and bicycle travel to local recreation areas.

Goal XI

Promote to the greatest extent possible, safe driving surfaces.

Policy 1

Maintain city streets and work toward elimination of uneven and narrow roads and other circulation restrictions and/or obstructions.

Goal XII

Protect life and property from the potential short-term and long-term deleterious effects of the necessary transportation, use and storage of hazardous materials within the City of Ceres.

Policy 1

Commercial and industrial concerns within the City will be required to provide the fire department and the City with a list of all hazardous materials used at the site, a description of where and how each is stored, and how each react in a fire.

Policy 2

The Department of Public Safety should maintain an inventory of all hazardous materials used and stored within commercial and industrial areas and the location at which each is used. Also, placards or appropriate signage shall be utilized on all buildings, which store hazardous waste or materials.

Policy 3

The discharge of hazardous wastes onto the City's land surface or into its natural water resources shall not be permitted.

Policy 4

The City shall ensure the safe transport of hazardous materials by designating truck routes and by achieving a land use pattern which discourages industrial access through residential areas.

Policy 5

The City shall encourage the location of environmentally sound industries and assembly operations rather than heavy industries or industries where large amounts of hazardous materials are known to be utilized.

Policy 6

Proposed commercial and industrial uses which have the potential for either receiving, utilizing, creating, or storage of hazardous materials in production processes shall be required as a condition of approval to provide a hazardous material plan outlining a source reduction plan as well as the treatment, handling, transportation, and disposal or hazardous wastes.

Policy 7

The City shall require the provision of on-site pre-treatment of hazardous wastes prior to disposal wherever feasible.

Goal XIII

It is the goal of the City of Ceres to promote and encourage the protection of the valley's water supply to assure the availability of clean and healthful drinking water in quantities sufficient to meet the domestic, industrial, and fire flows.

Policy 1

Encourage the wise and careful use of the Central Valley's potable water resources and encourage the utilization of water conserving designs and technology to protect this vital resource.

Policy 2

To the extent practical, encourage the use of low water consuming, drought resistant landscape plantings as a means of reducing water demand.

Policy 3

All development proposals brought before the City will be reviewed for potential adverse effects on water quality and quantity and will be required to mitigate any significant impacts.

Policy 4

Encourage programs which support water conservation through the installation of water saving devices in new homes, hotels, institutional and commercial developments.

Policy 5

Provide a water supply and distribution system for the City of Ceres to meet the residential, industrial, and fire flows.

Goal XIV

To ensure the protection of the public health, safety, and welfare from conditions of steep slopes and areas subject to erosion which pose significant hazards to life or property.

Policy 1

Development proposals for areas of 10 percent slope or greater, or areas subject to erosion will be accompanied by additional detailed soils and geotechnical studies when determined necessary by the City.

Policy 2

To protect aesthetic and natural resources, the City will develop and implement standards promoting, protecting, and enhancing slopes in the City and its sphere-of-influence.

Policy 3

Slopes and areas subject to erosion will be recognized as significant constraints to development and will be fully assessed when considering development proposals.

Goal XV

To ensure that City emergency procedures and resources are adequate in the event of the occurrence of natural or man-induced disasters.

Policy 1

The City shall conduct periodic emergency response exercises to test the effectiveness of City emergency response procedures.

Policy 2

The City shall maintain and improve the Multi-Hazard Functional Plan that addresses emergency preparedness and procedures to coordinate public action during times of disaster.

Policy 3

Coordinate emergency procedures and test drills with appropriate county and state agencies.

Policy 4

Encourage installation of emergency generators for public facilities and any future radio and television stations.

Policy 5

The future siting and development of critical and essential public facilities shall be reviewed to assure the maximum possible protection from environmental hazards as well as man induced.

Goal XVI

To protect the City and its residents from the threat of loss of life and property from natural and man-induced hazards through the provision of adequate levels of service and public awareness.

Policy 1

Publicize the City's channels for communication in the event of an emergency.

Policy 2

Periodically provide public education on disaster preparedness. Working through schools, voluntary organizations and City staff to ensure dissemination of information.

Policy 3

Undertake a program to disseminate public information on potential hazards and proper courses of action during an emergency situation.

Policy 4

Strengthen coordination between City officials and other agencies that provide disaster relief.

Goal XVII

The City should establish a redevelopment agency to assist in the recovery and redevelopment of areas affected by a disaster.

Policy 1

The City shall identify procedures to restoring essential services following a disasterous event.

Policy 2

The City shall prepare a program which establishes procedures to assessing damage.

Policy 3

The City shall prepare and maintain a plan for the removal and siting of debris.

Policy 4

The City shall establish a redevelopment authority to assist in and administer a program that leads to economic recovery.

Goal XVIII

The City shall closely coordinate the goals and policies of this Seismic and Safety Element with those of the Land Use, Open Space, Conservation, and other related elements of the Ceres General Plan.

Goal XIX

To promote and encourage the protection and wise utilization of the San Joaquin Valley's air quality to assure long term availability of clean and healthful air.

Policy 1

Encourage the safe and efficient movement of people and materials into and through the City as a means of reducing the impact of automobile and public transit traffic on local air quality.

Policy 2

All development proposals brought before the City will be reviewed for potential adverse effects on air quality and will be required to mitigate any significant impacts.

Policy 3

Encourage programs which support the preservation of clean air through the installation of emission control devices in all pro-

cesses or activities which have the potential to degrade air quality.

Policy 4

Promote the utilization of pedestrian and bike paths as a desirable alternative to the generation of unnecessary vehicular traffic in the City.

Policy 5

Participate in the development and coordination of mass transit/shuttle service linking major resort and commercial centers in the vicinity, and participate with regional associations and service providers to improve regional transportation services.

Policy 6

The City, in conjunction with Stanislaus Area Association of Governments and the State of California Department of Air Resources Board, should take an active role in encouraging the development and strict application of air quality regulations.

III. STATUTORY PROVISIONS

The State of California under Government Code Section 65302 (g) requires a safety element of all city and county general plans, as follows:

> Government Code Section 65302 (g): The general plan shall include a safety element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence and other geologic hazards known to the legislative body; flooding; and wildland and urban fires. The safety element shall include mapping of known seismic and other geologic hazards. It shall also address evacuation routes, peakload water supply requirements, and minimum road widths and clearances around structures, as those items relate to identified fire and geologic hazards.

This element meets all requirements of the State Planning Law. The safety element has been prepared in conjunction with various county and city agencies in order to fulfill the requirements of the State Planning Law. Many existing adopted General Plan elements assisted in the preparation of this element.

A. Scope

The scope and nature of a safety element is to introduce safety considerations in the planning process in order to

reduce loss of life, injuries, damage to property, and economic and social dislocation resulting from fire and dangerous geologic occurrences. This is accomplished by recognizing safety hazards, identifying goals for reducing risk and levels of acceptable risk, and specifying objectives to be attained in reducing safety hazards as related to existing and new structures as well as setting priorities for the abatement of safety hazards.

This element addresses a variety of safety considerations including seismic hazards, fire hazards, flood hazards and other hazards, and to some extent, crime. A diversity of safety hazards exist in the city and this element recommends policies for reducing those hazards as identified by the state. An evaluation of listed and other potential hazards is required in the formulation of local goals, policies, and programs.

B. Evaluation of Environmental Risks

There is no such thing as a hazard-free environment. However, efforts can be productively undertaken to mitigate the consequences of known hazards when they have been identified.

Hazards that may affect life and property may be divided into two major categories: man-made hazards and naturally-occurring hazards. The precise nature of either type of hazard within a given area is dependent upon a variety of environmental and cultural factors present.

Table 1 identifies those natural and man-made disasters which may impact Ceres residents and are described in detail in subsequent sections of this element. Table 1 also identifies the level of risk for each hazard and the geographical implications in the event of environmental upset. Each potential hazard to the public safety and welfare has been assessed according to the following levels of risk:

- Low Risk - The level of risk below which no specific action is deemed necessary. The occurrence of a specific event is unlikely.
- Medium Risk - The level of risk above which specific action is required to protect life and property, although the probability of the event taking place is low to moderate.
- High Risk - Risk levels are significant and occurrence of a particular emergency situation is highly probable or inevitable.

The "scope of risk" refers to the geographic area that could be potentially affected with the occurrence of one of the hazards. The scope of risk also includes three levels:

- Local - The affected geographic area that is directly

affected is localized or site specific;

- City-wide - The affected area includes a significant portion or all of the City; and,
- Regional - The affected area includes the entire City as well as the surrounding region.

The State Office of Emergency Services (OES) has established three levels of emergency response to peacetime emergencies, which are based on the severity of the situation and the availability of local resources in responding to that emergency. The three levels of emergency response include:

- Level 1: A minor to moderate incident wherein local resources are adequate in dealing with the current emergency.
- Level 2: A moderate to severe emergency where local resources are not adequate in dealing with the emergency and mutual assistance would be required on a regional or statewide basis.
- Level 3: A major disaster where local resources are overwhelmed by the magnitude of the disaster and State and Federal assistance are required.

Those hazards of greatest concern to Ceres residents are evident from the examination of the "level of risk" columns in Table 1.

Finally, "event duration" refers to the length of occurrence for a particular event. The residual effects of a particular event are taken into considered in this matrix although they may be long term in nature. An earthquake, for example, may only last for several seconds, but aftershocks may continue for many days, months, or in some instances even years. Fault displacement may result in permanent alterations in topography. Finally, property damage may be so extensive that complete recovery may take years. The following three categories are used in the classification of event duration:

- Immediate - The occurrence of a particular event is instantaneous or measurable in terms of seconds or minutes.
- Short-Term - The duration of a particular event is generally measured in terms of hours or days.
- Long-Term - The duration of a particular event extends for a much longer period of time. Specific hazards that are considered continuous or on-going are included in this category.

This report describes the environmental hazards summarized in Table 1 and explained in greater detail in subsequent sections. In addition, the resources that are available to respond in the event of an emergency situation are described in the City of Ceres Multi-Hazard Functional Plan.

The Council on Intergovernmental Relations guidelines separate risk into three distinct categories:

° Acceptable Risk: The level of risk below which no specific action by local government is deemed to be necessary.
° Unacceptable Risk: Level of risk above which specific action by government is deemed to be necessary to protect life and property.
° Avoidable Risk: Risk not necessary to take because individual or public goals can be achieved at the same or less total "cost" by other means without taking the risk.

A great deal of latitude and judgement must be exercised by local decision makers in carrying out the Safety Element.

C. Purpose

The intent of the Safety Element is to meet State Law, set priorities for safety considerations relating to existing and new structures, abate problems when and where possible, and involve all pertinent agencies in the planning process involving safety considerations.

The purpose of the Safety Element is also aimed at reducing death, injuries, property damage, and the economic and social dislocation resulting from both man-made and natural hazards.

II. SAFETY ASSESSMENT

A. Fire Safety

Fire hazards consist of two types - urban fires or wildland fires. The causes of the two types of hazards and their effect differ. While urban fires result in injuries and loss of property, brush fires may result in loss of natural vegetation, loss of agricultural crops, erosion of the soil and intrusion of the eroded soil into lower lying areas where it may be deposited.

1. Urban Fires

Urban fire hazards are primarily those associated with commercial, industrial, and residential structures and the activities that surround them. Most urban fires are caused by human activities, with the danger associated with any particular fire dependent upon the individual circumstances. Over the years, standards for development have been improved to reduce the frequency and severity of such fires. Building codes have been revised to utilize the most up-to-date construction methods in an attempt to make new buildings as safe as possible. Fire walls are now required when buildings

TABLE 1
ENVIRONMENTAL RISK ASSESSMENT FRAMEWORK

ENVIRONMENTAL HAZARD	POTENTIAL OF OCCURRENCE			SCOPE OF RISK			EMERGENCY ENERGY RESPONSE			EVENT DURATION		
	Low	Medium	High	Local	City	Regional	Level I	Level II	Level III	Immediate	Short Term	Long Term
Earthquake		X				X		X			X	
Surface rupture	X			X				X		X		
Liquefaction	X			X				X		X		
Ground-shaking		X			X	X		X	X	X		
Slope failure	X			X			X				X	
Landslide	X			X			X				X	
Flooding	X			X		X	X				X	
Local ponding		X		X			X				X	
50 year flood	X					X		X			X	
100 year flood	X					X		X			X	
Fire												
Urban		X		X			X	X		X		
Wildland	X			X			X	X		X		
Industrial		X		X			X	X		X		
Chemical		X			X		X	X		X		
Gas main	X			X			X	X		X		
Subsurface	X			X			X	X		X		
Chemical Contamination												
Road spill			X	X			X	X		X		
Subsurface		X			X			X				X
Radiological	X				X	X		X	X			X
Major Accident												
Industrial		X		X	X		X	X		X		
Major road			X	X	X		X	X		X	X	
Aircraft		X		X			X	X		X		
Railway		X		X			X	X			X	
Water Shortage		X			X	X		X	X		X	

are built close together or near a property line. Electrical standards have changed to required safer construction.

Consequently, fire hazards are greatest in areas containing older buildings which do not meet current building codes. Property damage from urban fires can be financially substantial although in the majority of cases damage can be limited to few structures. Injuries and deaths are more frequent in residential fires than any other type since they occur in structures that are inhabited.

2. Wildland Fires

Four factors contribute to wildland fires: vegetation, climate, topography and people. Chaparral, grasslands, and other wild plant life provide the major sources of fire fuel. Stanislaus County has a Mediterranean type of climate with cool, wet winters, and hot, dry summers. The hot, dry summers in Stanislaus County produce large areas of extremely dry vegetation often located in areas where the topography enhances the spread of flames and prohibits access for fire fighting equipment. The existence of people in these areas increases the chances of fire.

The river bluff areas north of the City pose as a fire hazard during periods when dry grass and brush exist.

3. Other Fire Hazards

Another threat to fire safety involves all of the nonstructural items found in buildings, especially residences. These items include home furnishings, office equipment, synthetic fibers, plastics, household products, hazardous materials, and appliances. Two dangers of fire safety involve lack of knowledge about materials which are combustible and product or structural designs which increase fire risk.

Potentially hazardous utility facilities encountered in Ceres include buried gas lines and overhead electrical power lines. While the normal construction of utility lines provides a good degree of safety, gas lines can break (related to seismic hazards) and power lines can come down. They should not be overlooked, as they can become fire hazards.

Major earthquakes, less likely to occur than a man-induced event, can rupture gas lines or storage tanks, causing severe explosions and fire over a widespread area. Thus, design and placement of facilities should be responsive to policies and programs found in the Seismic Safety portion of this Element.

4. Local Response

The Ceres Department of Public Safety Emergency Services Division not only provides fire protection to the City, but to an area almost equal in size, on the fringe of the City (see Map 1). The department consists of nine full-time employees and 38 volunteers.

Ceres has one fire station, which is located at the corner of Third and North Streets. This station houses six fire fighting pieces of equipment, including four engines, one tender, one rescue squad, and four staff vehicles. The tender's capacity is 3,000 gallons of water.

The City has experienced rapid growth in the last few years. City officials have realized, as Ceres expands, improvements within the City are needed.

The Division of Emergency Services has submitted a six year capital improvement plan to the City which spells out the progress the department hopes to achieve by the mid-1990's. The major thrust in this plan includes the building of a second and third satellite fire station in North and West Ceres, acquisition of a fourth existing fire station, and securing additional men within the next few years. Recent and projected growth of the City is primarily to the west and the north.

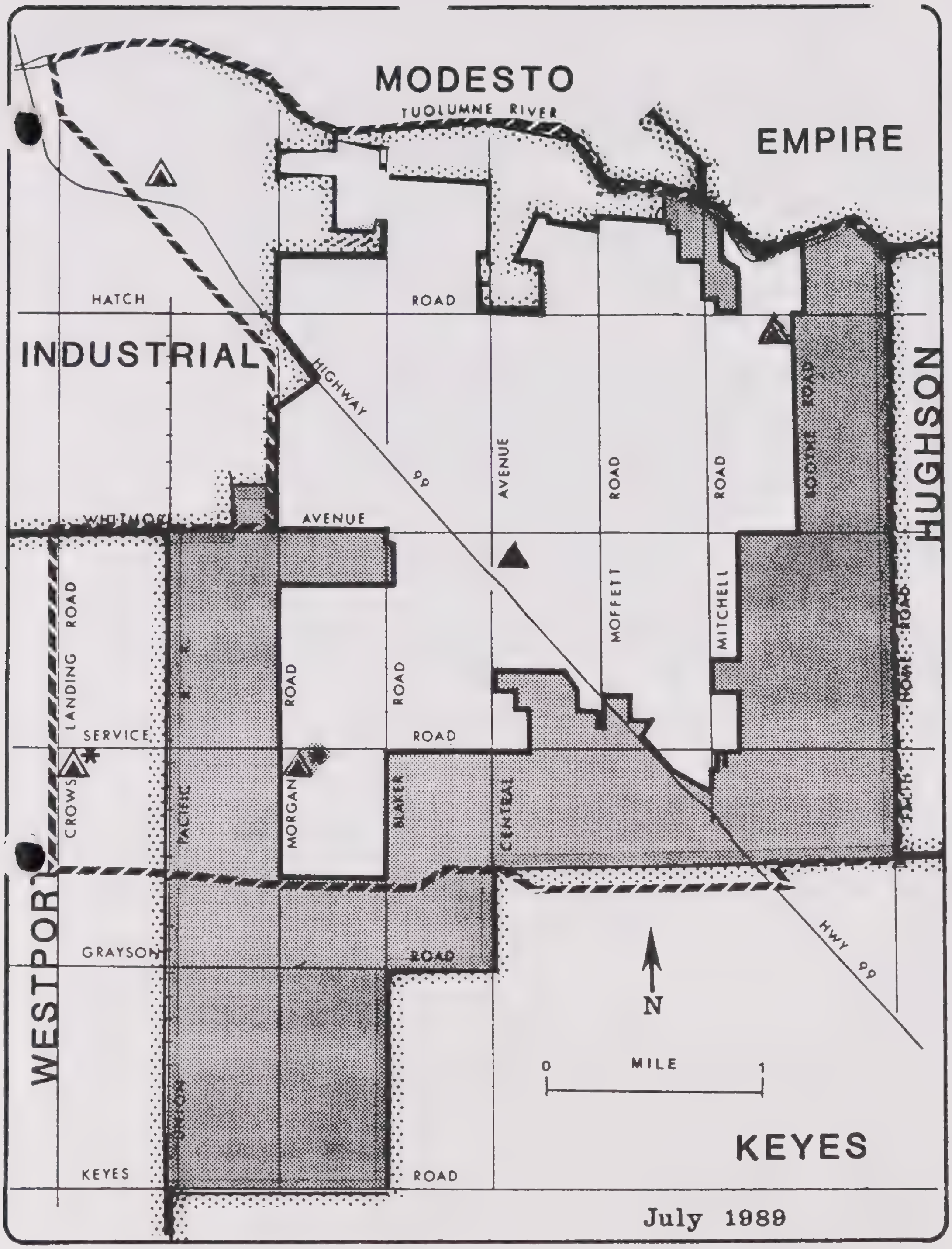
The major fire prevention programs carried out by the Division of Emergency Services includes:

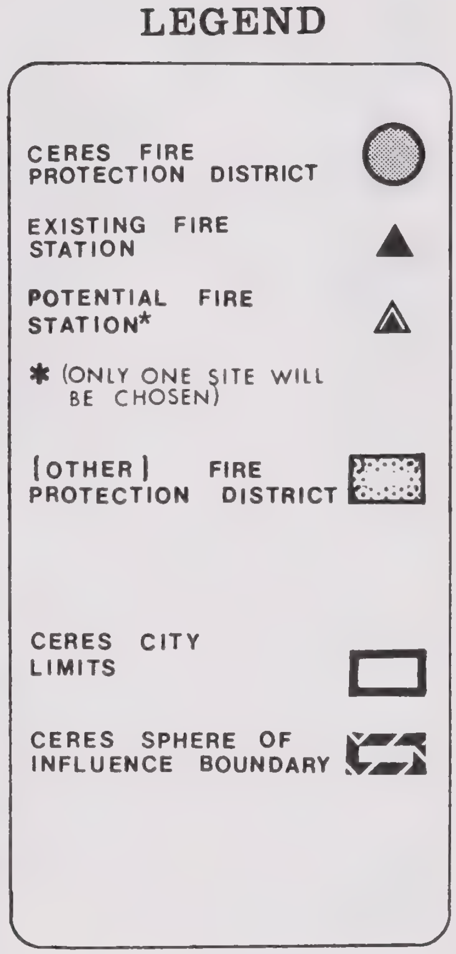
a) Community educational programs;
b) Systematic inspections of schools, churches, day care centers and homes;
c) Alley and vacant lot inspection on a semiannual basis;
d) Fire Prevention Bureau maintains a data base of information on the location and type of hazardous materials.

Another important function conducted by the Division of Emergency Services includes a review and analysis of subdivision plans. These plans are reviewed for adequate fire routes and fire hydrants. Valuable input is also received by the Ceres Planning Department with respect to safety.

In 1988, the Emergency Services Division received 1,024 calls. An increase of approximately 93% in calls were received from the previous year. The calls included rescues, medical service, vehicle fires, wire down, structural, brush, grass fires, as well as mutual aid for local and state requests. Most of the calls for service were medical and rescue by nature.

Division of Emergency Services officials encourage citizens to install adequate heat and smoke detectors in existing homes and businesses to warn occupants and to alert the Division of Emergency Services in case of fires. Installation of these two devices would go far in reducing the risks to life and property





* Potential Fire Station sites depict location within a general area.

FIRE PROTECTION DISTRICT

from fire hazards. Structures being built today are required by building codes to install heat or smoke detectors in strategic locations throughout the building.

Guidelines recommended in the City's 1995 Water System Master Plan for the installation of mains will be applied to each new subdivision or development approved in the City. The guidelines directed towards fire protection are as follows:

- Fire hydrant spacing should be, at minimum, 300 feet in residential areas and 300 feet in commercial areas; in no case, should the average coverage of each hydrant be more than 120,000 square feet. Fire hydrants should be located at street intersections rather than in the middle of blocks. This permits flow from at least two and usually three separate source lines, thus increasing hydrant potential.

- Install hydrants with 6-inch lead lines connecting to 6-inch or larger mains.

- All hydrants should have independent valves between the hydrant and the main.

- All hydrants should have at least a 5-1/4 inch opening. In commercial areas, all hydrants should have two 2-1/2 inch hose opening and a 4-1/2 inch pumper opening. All hydrants shall conform to the standards of the National Board of Fire Underwriters.

5. Mutual Aid

No community has the resources to effectively handle all potential emergencies. For this reason, fire departments and police departments have increasingly utilized mutual aid agreements and plans. The magnitude, complexity and frequency of various emergencies throughout California has placed greater emphasis on coordinated plans. The framework for mutual aid is based on each local jurisdiction exhausting its own resources prior to calling for assistance from its neighbors. When the Director of Public Safety, Division Commanders, and/or Incident Commander determines that an emergency situation may become or is already beyond the control of the department's resources, it is the Director of Public Safety or Division Commander's responsibility to request mutual aid from back-up departments in the area.

Communication and coordination among emergency service personnel has been underway for a number of years and it is evident that the City will continue to maintain levels of safety as great, if not greater, than at present.

B. Flooding

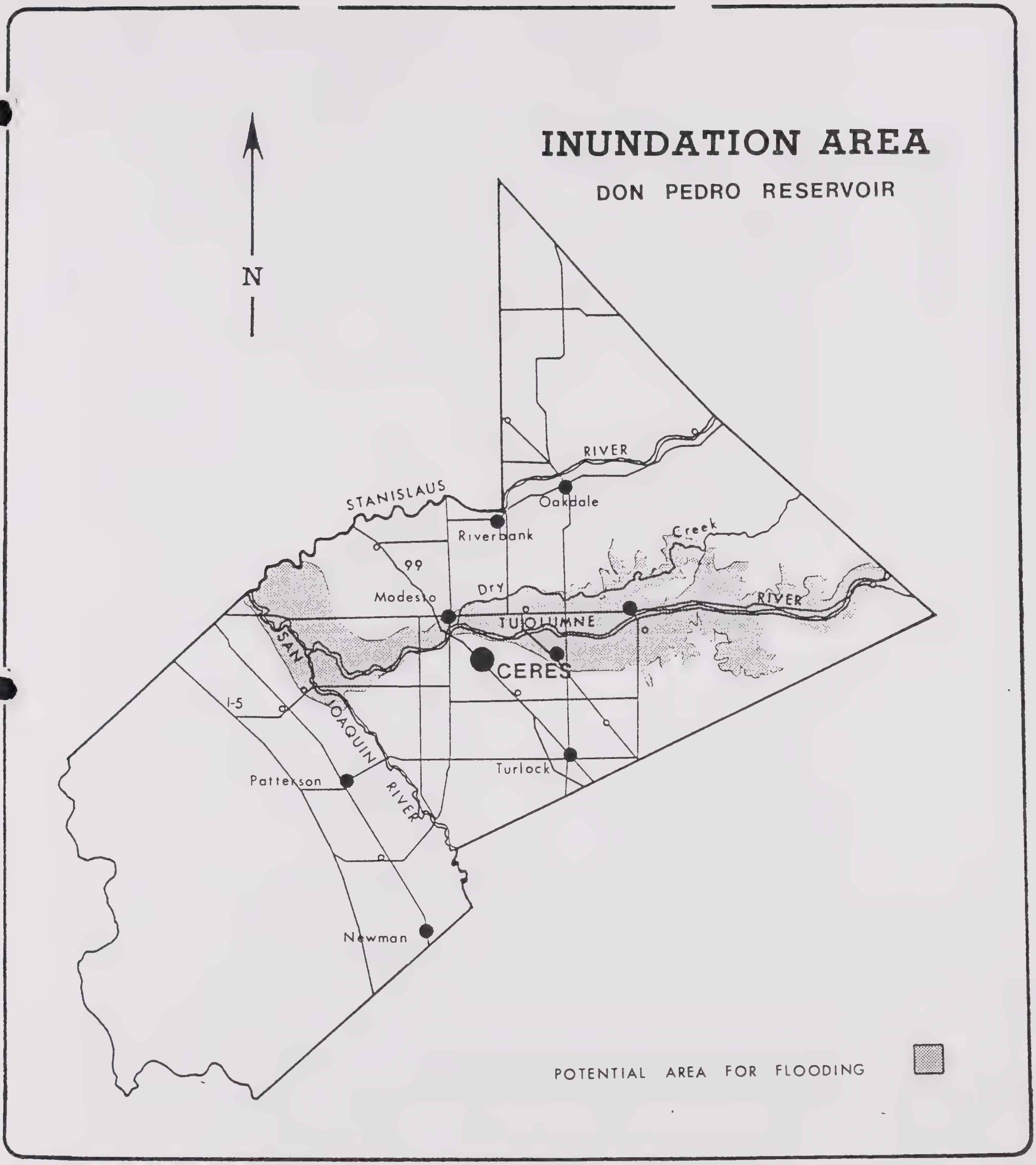
Flooding has been a recurring problem throughout the history of Stanislaus County. Three major floods have taken place in the last 30 years. The biggest flood in the County's history was in 1861 when the valley was covered by a body of water 250 to 300 miles long and 20 to 60 miles wide. Today, the potential for such a major flood is quite remote. The new Don Pedro Dam on the Tuolumne River should be able to handle maximum water loads in all but the most severe years. In a similar fashion, the new Melones Dam also has a large carrying capacity minimizing future flood potential. State law requires that the State Office of Emergency Services (OES) identify all dams in the State whose failure would cause injury or loss of life and prepare maps indicating areas of inundation. Maps 2, 3, and 4 indicate probable inundation areas.

1. Inundation

Although the possibility is remote, failure of the reservoirs east of the county could have devastating consequences for residents in various parts of the county. From Map 2, it can be seen that all of La Grange, Waterford, Hickman, Hughson, Empire, and parts of Modesto would be inundated if the Don Pedro Dam failed. Similar consequences would result to Stanislaus River communities if either New Melones Dam or the Tulloch Dam were to fail. The City of Ceres would be unaffected by inundation because of its location (see Maps 3 and 4). However, for displaced persons, reception centers should be provided.

Primary areas of concern for the City of Ceres are: the Tuolumne River, north of town and the impact of a sudden high rise on Dry Creek; and assisting other cities and agencies in the county that are more vulnerable to flooding (see map 4).

A total failure of Don Pedro Dam would inundate both sides of the Tuolumne River to the confluence of the San Joaquin River. Perhaps 50,000 to 80,000 people, or one-fourth of the population of Stanislaus County could be directly affected by flood waters. As can be seen in Map 2, Ceres would be relatively unaffected. For this reason, areas sustaining little or no damage would be expected to provide support to affected areas. This could partly be accomplished by acting as a reception center. When the emergency situation is beyond the capability of local city and county governments, help will be requested from the state government. If state capability is insufficient, federal assistance will be requested. Maximum coordination and cooperation among the various local cities, special districts, agencies, and the county is an absolute necessity.

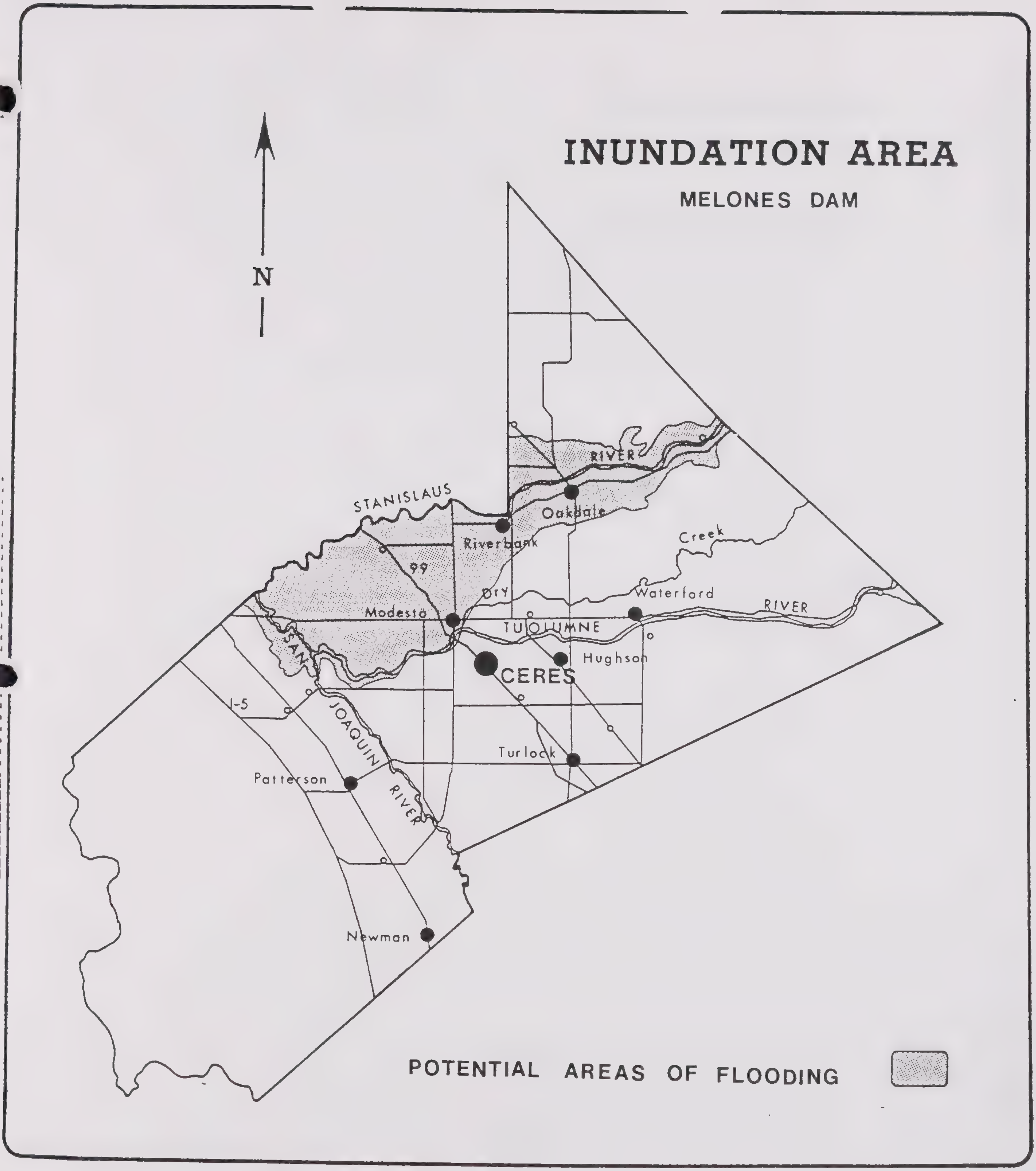


(TO BE UPDATED WHEN DATA IS AVAILABLE)

This map was prepared solely to delineate areas of potential flooding resulting from dam failure. It is recognized that, from an engineering standpoint, inundation mapping depends upon empirical analysis. Precise calculations, to include determination of depths and velocities are beyond the current state of the art. Therefore, conservative assumptions were made within the limits of good engineering judgment, as to the extent and rapidity of failure and as to the probable routes that water would follow. Thus the inundation area shown encompasses all probable routes. The flow would not necessarily cover the entire area within the inundation boundary. This map is considered to be strictly a contingency measure and does not imply in any way that the dam is unsafe. Use of this map for any purpose other than for evacuation planning should be made with extreme caution and within the limitations pointed out above. Source: Stanislaus County Planning Department.

MAP 2

(TO BE UPDATED WHEN DATA IS AVAILABLE)



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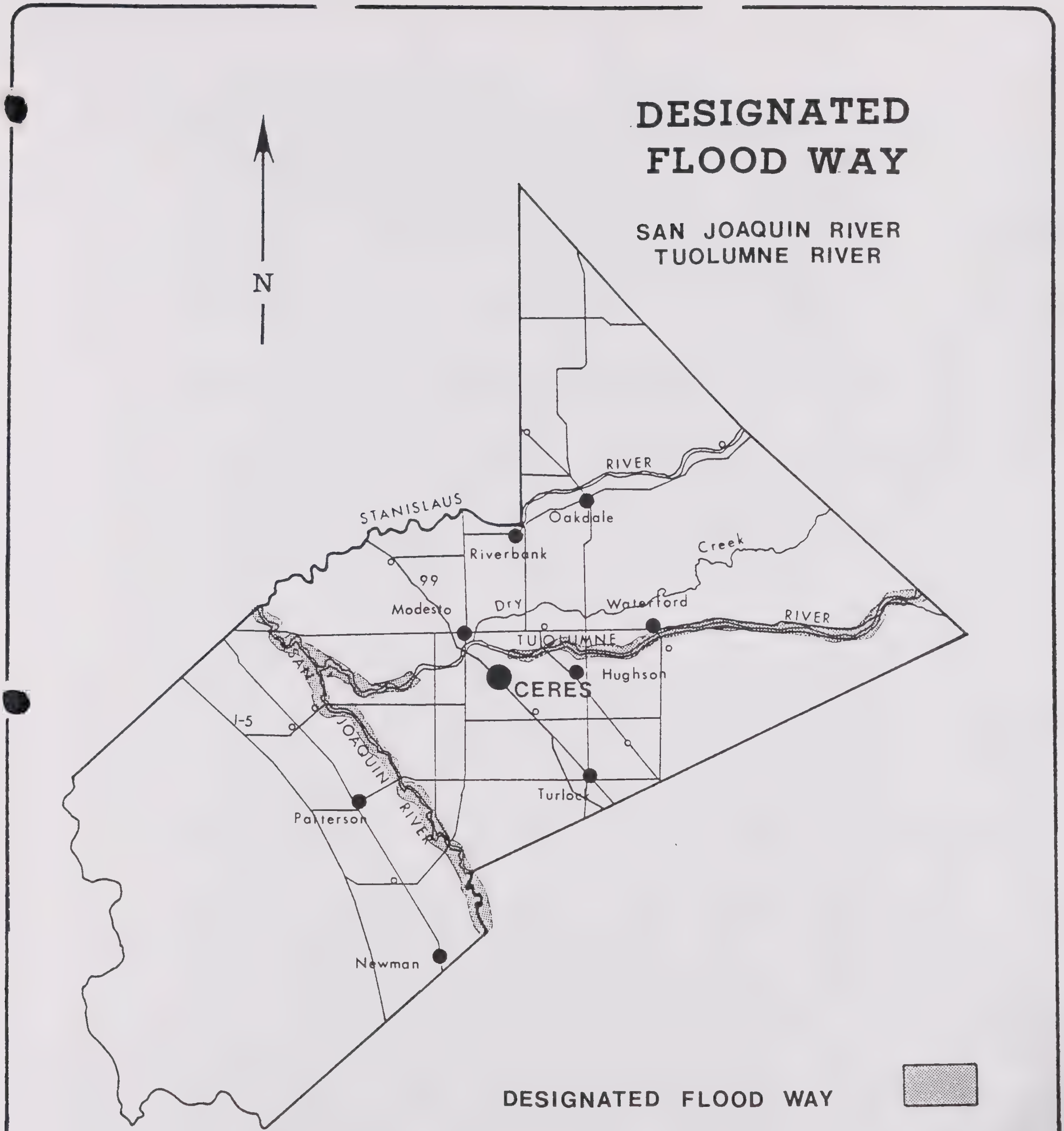
MAP 3



Source: Stanislaus County Planning Department.

(TO BE UPDATED WHEN DATA IS AVAILABLE)

MAP 4

2. Local Response

The County Deputy Director of the County's Administrator's Office has prepared an evacuation plan for areas below Don Pedro, Melones, and Tulloch Dams. A joint contingency plan for Stanislaus County and cities within the county has been established for identifying procedures for the evacuation and control of populated areas, and for subsequent re-entry into such areas. This plan is an integral part of and extension to Stanislaus County's Basic Emergency Plan and the plans of the nine incorporated cities in the county.

The plan being prepared by the Office of Emergency Services has been adopted. Departments throughout the City of Ceres will be coordinated into this overall plan.

The National Flood Insurance Program has classified the City of Ceres to be in a flood zone classification of "C", areas of minimal or non-flooding. Localized concentrations of water during moderate rainfall do occur because of the flat terrain of the region. The City has an adopted Master Storm Drainage Plan designed to address local storm run-off.

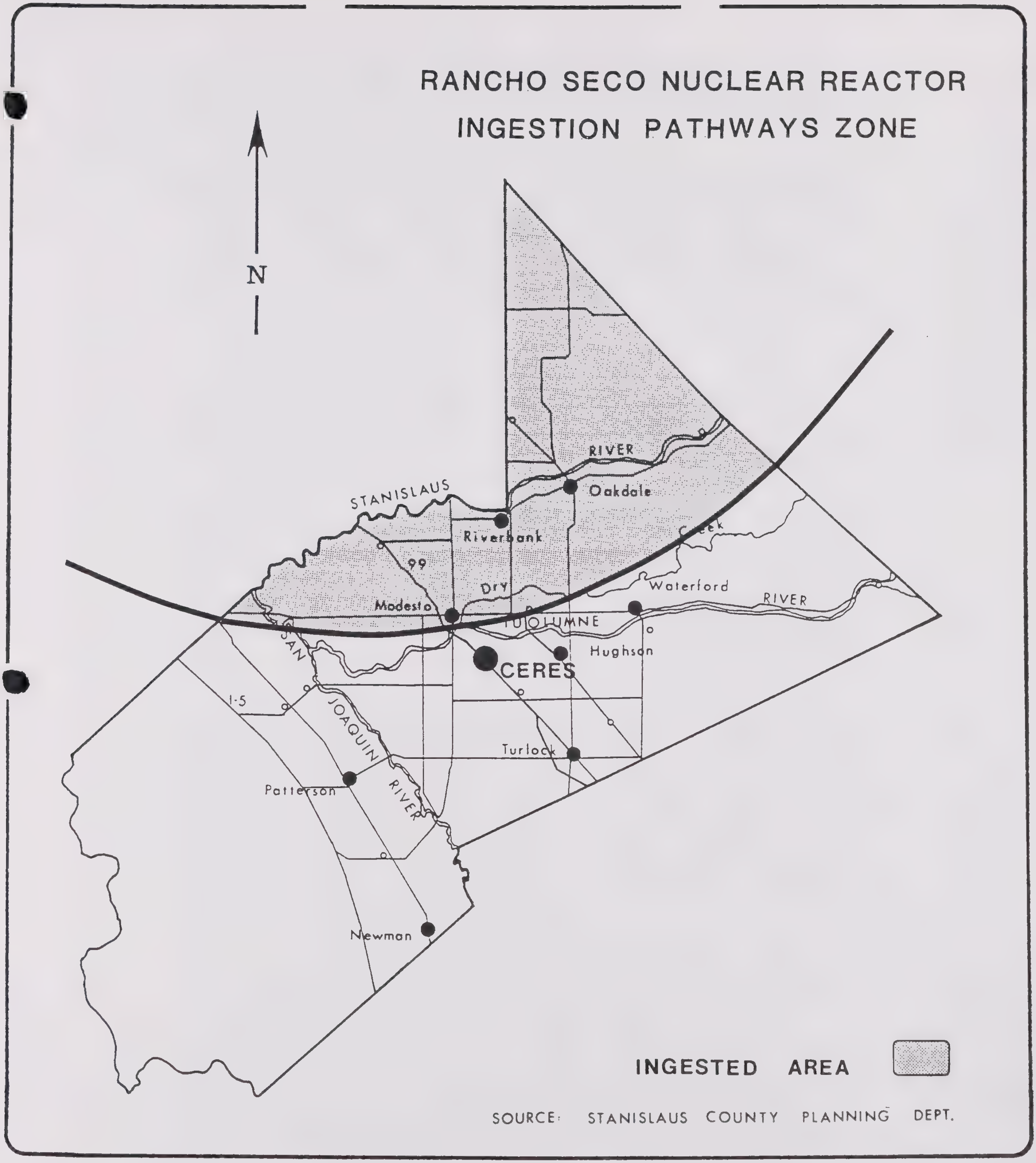
C. Nuclear Safety

Even though nuclear reactors and materials contain safeguards, there is no historical reference to indicate to what degree these facilities might be harmful to the environment. The Element suggests that they be sited properly and that the public be properly informed about procedures and safety arrangements. This may be inadequate since there is little or no historic information. The impact on the environment would essentially come when the facilities were not properly maintained or where safety standards were not enforced.

Although the county has no nuclear reactors within its boundaries, part of it is within the Ingestion Pathways Zone (IPZ) of the Rancho Seco reactor near Sacramento. If Rancho Seco were to experience a "melt-down", the northern portion of the county would be affected. Map 5 depicts the location of this zone. Although there would be little effect from the radiation on humans, no food or water from this area could be eaten. "Ingestion" of plants, animals (or their by-products, such as milk) could be hazardous. The County Office of Emergency Services is coordinating disaster planning with their state counter-part. Measure S, a proposal to complete the shut down of Rancho Seco, was recently passed. If Rancho Seco is reopened, then the potential hazards listed above remain.

D. Seismic Safety

The greatest loss of life and property in California due to geologic hazards have been caused by violent ground shaking


RANCHO SECO NUCLEAR REACTOR
INGESTION PATHWAYS ZONE
N
STANISLAUS
RIVER
Oakdale
Riverbank
99
DRY
Creek
Waterford
RIVER
Modesto
TUOLUMNE
Hughson
CERES
SAN
JOAQUIN
RIVER
I-5
Turlock
Patterson
Newman
INGESTED AREA
SOURCE: STANISLAUS COUNTY PLANNING DEPT.

during earthquakes. This form of ground movement is largely due to release of seismic energy during periods of sudden displacement along a fault.

California is the most seismically active area in the United States. Ceres is located in a low, expectable earthquake severity zone as displayed on Map 8. A brief discussion of seismic activity and its hazards is discussed below. Appendix B provides an overview of the valley's geologic formation and potential earthquake frequency and anticipated scale.

1. Earthquake Safety

Ground movement and earthquakes have occurred since the beginning of time, however, it has only been recently that the fundamentals of their effects are being understood so we may more effectively deal with the hazards they present.

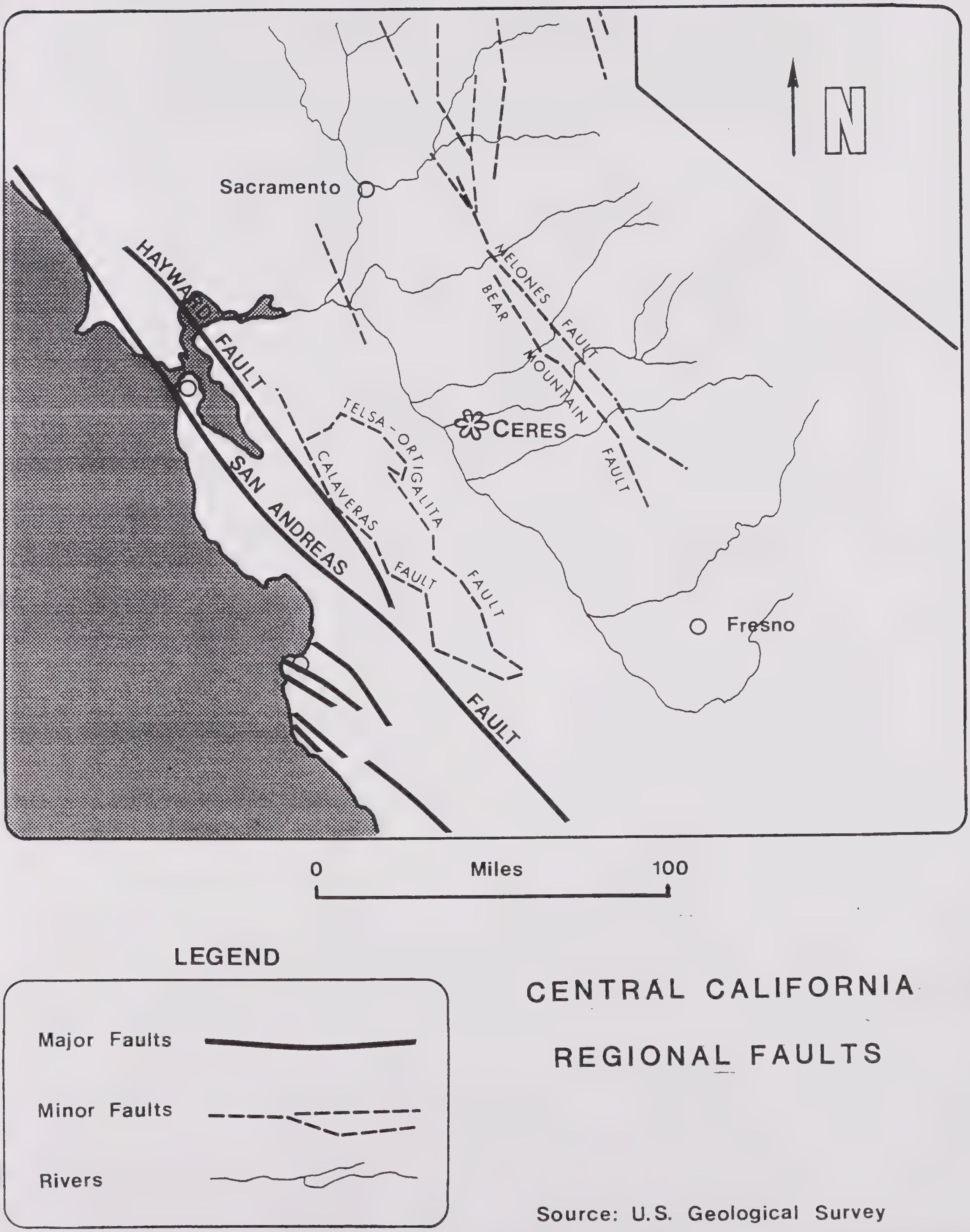
Because of the importance of seismic activity in the State of California, an amendment was made to the Government Code in 1971 to require each city and county to include an appraisal of such hazards in their General Plan. The basic objectives of these elements are to draw attention to problems of earth movement, and suggest methods to reduce loss of life, injuries, damage to property, and economic and social dislocations resulting from future earthquakes.

Earthquakes have become a major consideration in many aspects of planning throughout California in response to the high level of the State's seismic activity (the highest of any state in the nation). In Stanislaus County, the earthquake activity potential is moderate in comparison with many of the other northern California counties. Because of the various ways in which earthquake activity can threaten life and property in the county, the actual destructive potential is significant. The present fault zones within and near the county are depicted in Maps 6 and 7.

Only one earthquake of any significance has been recorded in Stanislaus County. It was rated 4 to 4.9 on the Richter Scale and was located on the county's west side along the Telsa-Ortigalita Fault Zone, an area which is active in producing very minor tremors. The minor faults which penetrate the county on the southeast corner near La Grange as well as the Melones and Bear Mountain Fault Zones just east of the county, had their major activity taking place millions of years ago and presently are believed to be relatively inactive.

Numerous earthquakes occur each year along California's major faults which are the San Andreas, Calaveras, Hayward, and Nacimento Faults (see Map 7). Information furnished by the State Department of Mines and Geology and the State Office of Emergency Services indicates that ground shaking along these faults can produce damage within the county to reach varying intensities rated on the Modified Mercalli


GEOPHYSICAL FACTORS
Stanislaus County
North
0 1 2 3 4 5 6
MILES
Prepared by Stanislaus Area Association of Governments 1972
LEGEND
MINERAL SITES
gas field
Cr Chromite
Hg Cinnabar
Mg Magnesite
Clay claypit
sand & gravel
GEOLOGIC HAZARDS
Fault lines
Landslides
Area of geologic formations known to landslide
MODESTO
clay



CENTRAL CALIFORNIA

REGIONAL FAULTS

Source: U.S. Geological Survey

Intensity Scale of 1931. The eastern half of the county can be expected to have shaking to an intensity of VI or VII, producing minor to moderate damage. The western half of the county can expect to receive shaking to an intensity of VII or VIII Mercalli which can cause considerable damage to ordinary structures. The City of Ceres may have shaking intensity of VI to VIII. A copy of the Modified Mercalli Intensity Scale is shown in Table 2.

The vast majority of deaths during earthquakes are the result of structural failure due to ground shaking. The most serious threats to public safety are the secondary effects which can occur with earth motion; for example, falling objects, structural failure of old buildings, swinging doors, broken gas lines, fallen electrical lines, moving furniture, etc. Ground shaking in Stanislaus County is certainly not limited to quakes within the county or even neighboring counties. High earthquake activity throughout Northern California and Nevada have in the past caused structural damage throughout Stanislaus County. For example, the 1906 San Francisco Earthquake with its epicenter in Marin County, caused cracking of downtown Modesto buildings and toppled railroad water tanks.

Map 8 shows the probable maximum earthquake intensity that can be expected to be felt in various parts of the county. It can be seen that the City of Ceres is in a severity zone that is considered low.

TABLE 2

MODIFIED MERCALLI INTENSITY SCALE

INTENSITY	AFFECT
I.	Not felt. Marginal and long-period effects of large earthquakes.
II.	Felt by persons at rest, on upper floors, or favorably placed.
III.	Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV.	Hanging objects swing. Vibration like passing of heavy trucks; or sensation of or sensation of a jolt like a heavy ball striking the walls. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV, wooden walls and frames creak.
V.	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.
VI.	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and masonry D cracked. Small bells ring (church, school). Trees, bushes shaken (visibly, or heard to rustle).
VII.	Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments). Some cracks in masonry C. Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.
VIII.	Steering or motor cars affected. Damage to masonry C; partial collapse. Some damage to masonry B; none to masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX.	General panic. masonry D destroyed; masonry C heavily damaged, sometimes with complete collapse; masonry B seriously damaged (general damage to foundations). Frame structures, if not bolted, shifted off foundations. Frames cracked. Serious

damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluviated areas, sand and mud ejected, earthquake fountains, sand craters.

X. Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.

XI. Rails bent greatly. Underground pipelines completely out of service.

XII. Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.

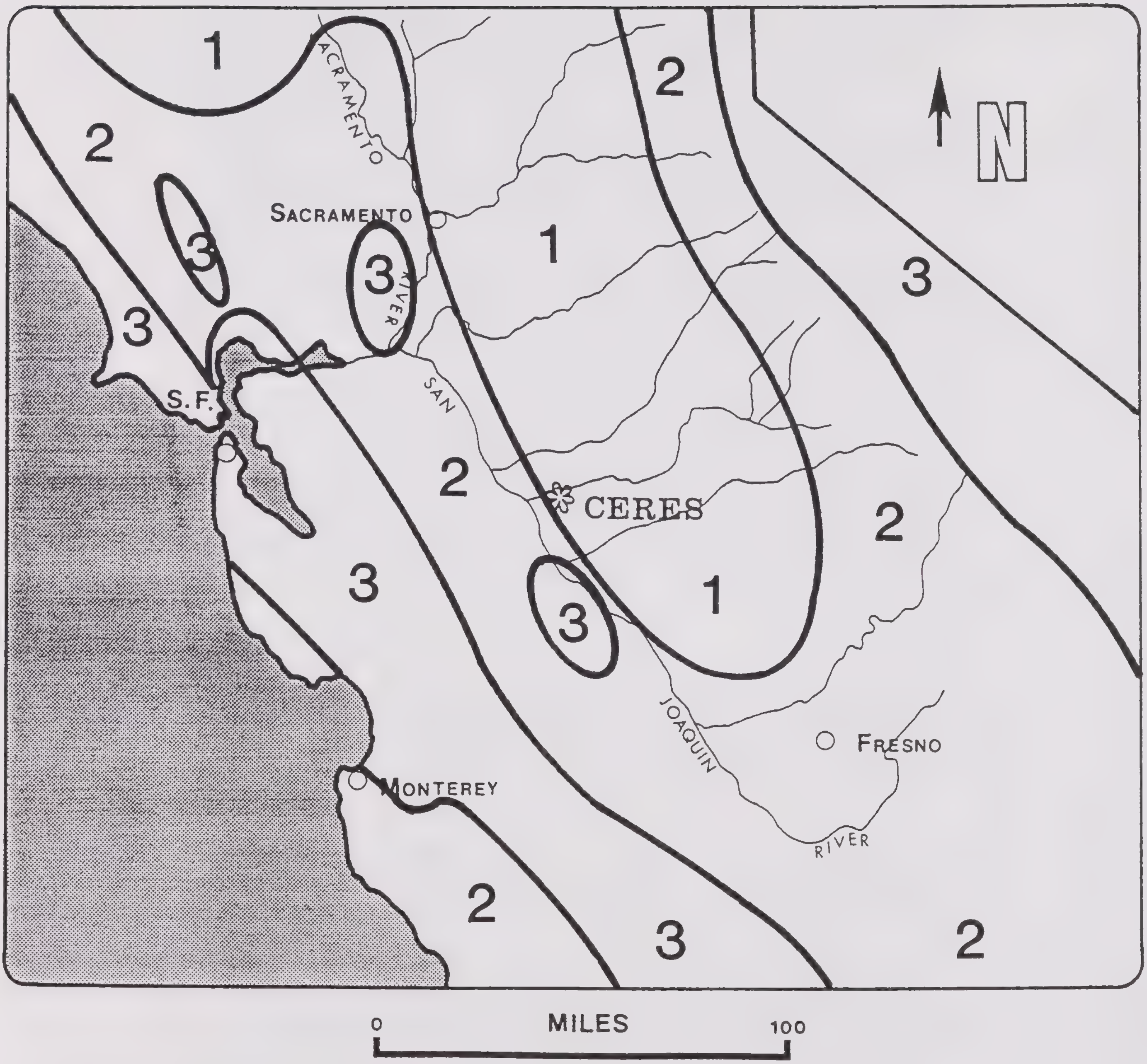
Definition of Masonry A, B, C, D:

<u>Masonry A</u> - good workmanship, mortar, and design; reinforced, especially laterally, and bound together by using steel, concrete, etc; designed to resist lateral forces.

<u>Masonry B</u> - good workmanship and mortar; reinforced, but not designed in detail to resist lateral forces.

<u>Masonry C</u> - ordinary workmanship and mortar; no extreme weaknesses like failing to tie in at corners, but neither reinforced nor designed against horizontal forces.

<u>Masonry D</u> - weak materials, such as adobe; poor mortar; low standards of workmanship; weak horizontally.



LEGEND

MAP SYMBOL	MAXIMUM PROBABLE INTENSITY*	SEVERITY ZONES
1	VI–VII (Minor Damage)	LOW
2	VII–VIII (to)	MODERATE
3	IX – X (Major Damage)	HIGH

MAXIMUM EXPECTABLE EARTHQUAKE INTENSITY

SOURCE: Bulletin 198–CA Division of Mines and Geology

2. Local Response

New seismic requirements of the Uniform Building Code have virtually eliminated the collapse hazard for new buildings throughout the county. New standards are being applied to building codes to resist various earthquake intensities. The major problem for nearly all of the county relates to older structures. A systematic program should be established to abate buildings that are considered dangerous to occupants throughout the City. Knowledge of earthquake-resistant design and construction has increased greatly in recent years, though much remains to be learned.

The Seismic Safety Element suggests methods to reduce hazardous conditions through building codes, health codes, zoning and subdivision regulations and other appropriate methods available to the City for reducing seismic risks.

Seismic activity goals, policies, and programs are included in this element to address this safety concern. The latest building codes should be adopted to stay abreast of the latest developments in this rapidly changing environment. The protection of structures through regular inspections and enforcement should be done in such a way that results in improvements in safety, both to the citizens and the community.

E. Traffic Safety

The vehicular movement of people and goods throughout the City face minimal traffic hazards. Traffic accidents involving several vehicles continue to occur. Accidents have occurred due to poor driving conditions, road overcrowding, and road conditions.

Chances of accidents occurring increase due to poor driving conditions. Driving conditions deteriorate during winter months as a result of dense fog and slippery road surfaces.

Traffic hazards also increase with the overcrowding of roads. Already developed roads are physically limited to conduct a safe traffic flow. As a result, road overcrowding takes place. Increased traffic will tend to increase the probability of an accident to occur. Increased use of streets will let road conditions deteriorate more quickly. Pot holes and other uneven surfaces are examples of road deterioration due to overcrowding.

Road widths vary within the City of Ceres. Street classification and standards are developed in conjunction with the Circulation Element of the General Plan. The General Plan has designated the following street classification to various areas within the City: freeways, major thoroughfares, primary collector streets, secondary collector streets, and minor streets. Minor streets have a minimum right of way 46 feet. The City's minimum road width stan-

dards will allow emergency vehicles to deliver a prompt and safe response.

Traffic accident information is on file with the Department of Public Safety and the Office of the City Engineer. This information can be used in making land use decisions that affect the safety of vehicular traffic.

In 1975, an accident surveillance study was conducted by the engineering firm of De Leuw and Cather. The objective of this study was to identify and analyze locations throughout the community that were found to be accident prone. This study listed various recommendations which are primarily related to traffic safety programs and secondly, includes those recommendations which are optional or which are not as critical.

F. Modesto City-County Airport

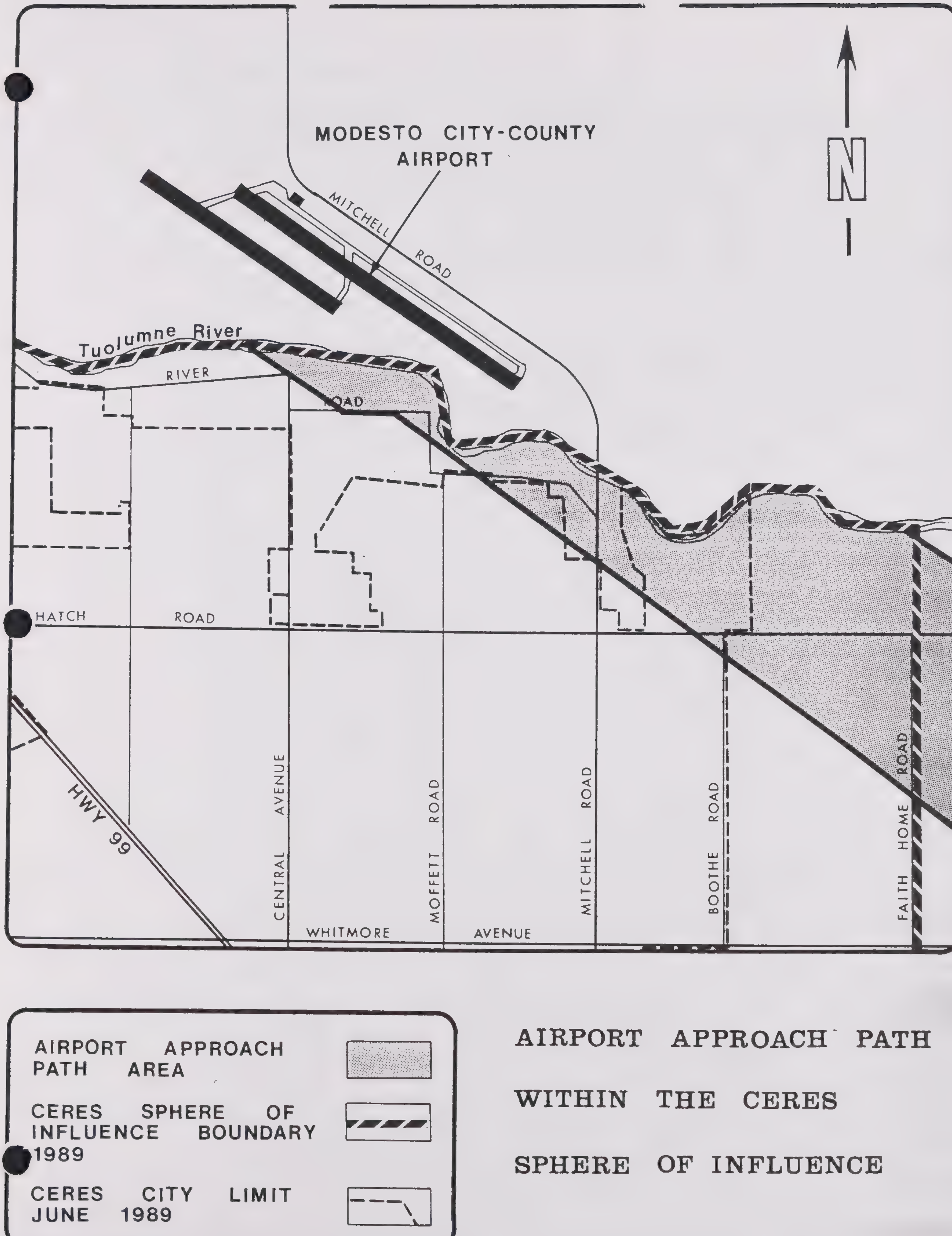
1. Air Safety

Airplanes and the associated ground facilities (airports, air strips) cause some safety hazards. Approach and take-off patterns should be kept free from incompatible uses. Incompatible uses that cause safety problems range from dwellings to high structures. A malfunction in an aircraft causing a crash when landing or take-off would cause more loss of life in a residential area than it would in an agricultural area. It would also be easier for a pilot to execute an emergency landing in an open area, uncluttered by houses. Tall structures, such as buildings and antennas, are hazardous to the airplanes as well.

The Modesto City-County Airport located on Mitchell Road, adjacent to the Tuolumne River has been located at its present site for approximately 60 years. The airport is located in the City of Modesto, but its influence is felt both in the County and the City of Ceres. Major improvements have been made to the airport to provide for jet airline service. Growth for the airport in terms of increased passenger service and air cargo is expected to increase in the next ten years.

The runway configuration at the Modesto City-County Airport consists of two parallel runways aligned in a southeast-northwest direction. Both runways are equipped with a runway lighting system. The airport is an all-weather facility equipped with full instrument landing and radar facilities.

Approach and take-off patterns for aircraft using this facility intersect portions of the City of Ceres' sphere of influence. Specifically, those properties lying south of the Tuolumne River are within the influence of air traffic using the airport (see map 9).



AIRPORT APPROACH PATH WITHIN THE CERES SPHERE OF INFLUENCE

2. Local Response

A master plan prepared for the City-County Airport describes in detail various impacts in air traffic and what subsequent modifications will have on adjoining properties. Noise is one such item discussed, however, it is beyond the scope of this element to accurately evaluate noise impacts. These impacts will be discussed in a subsequent element of the Ceres General Plan. It is safe to state that, with an increase in air traffic and its accompanying noise impacts, the airport is becoming a very significant influence in the determination of land use.

Stanislaus County has an Airport Land Use Commission (ALUC) which reviews land use proposals within the approach patterns of airports within the county (not air strips). The Commission bases its actions on whether or not the proposed development meets compatibility criteria identified in the Airport Land Use Compatibility Listing of the adopted ALUC Plan.

An adequate data base for the consideration of safety in land use planning is not presently available. The evaluation of risk potential coupled with the probability of accidents does not provide specific information as to which areas in a community require aircraft safety protection. The areas around airports that most likely will experience accidents are usually within a one to two-mile radius, at either end of runways. This covers a very large area in the Ceres environs. The airport manager indicated that 1.38 fatal accidents occur within a one-mile radius of airports for each million aircraft operation. It is known that the majority of near-airport accidents occur in a narrow band around the ends of the runways.

The master plan prepared for the City-County Airport recommends the adoption of an airport height limiting zoning ordinance based on Federal Aviation Administration regulations for all jurisdictions in the vicinity of the airport. This includes the City of Modesto, Ceres, and Stanislaus County. The City of Ceres has adopted an Airport Overlay Zone to prevent hazards that may endanger the lives and property of both users of the airport as well as area residents in the vicinity of the airport.

The City of Ceres shall actively participate in the master plan for the Modesto-County Airport and review with strong interest the noise affect of the increased air traffic over the City of Ceres. The City of Ceres is to encourage and strongly suggest the use of new noise effective engines for the newer type aircraft. The net result would be to lessen the noise impact upon the community of Ceres as new commercial traffic increases at the Modesto-County Airport.

The City of Ceres, while participating in the Master Plan and the Modesto-County Airport Land Use Update, to discuss and review land uses occurring underneath the Approach Zone within the City of Ceres to insure continued safety for all present whether they be work force or residents.

G. Public Safety

Crime is a complex social phenomena, the causes and effects of which are beyond the scope of the General Plan. The purpose of including this section on crime in the Public Safety Element is to acknowledge that there is a definite relationship between crime and the physical design and layout of the community, and to discuss mechanisms that may be utilized for incorporating crime safety into the existing urban environment and the development process of the community.

1. Public Safety: Concept of Defensible Space

Sociologists and criminologists have offered innumerable theories about the causes of crime and the fear of crime in our society. It is clear that law enforcement alone cannot solve these problems. In recent years, there has been growing interest and research into the relationship between physical design and criminal activity. Defensible space is a concept used to describe this relationship. The term denotes an environment whose physical characteristics -- building layout and site plan -- function to allow occupants themselves to become the key agents in ensuring their own security.

A thorough discussion of defensible space is beyond the scope of the Public Safety Element. It is mentioned here only as a means of introducing crime safety consideration into the development process of the community. Defensible space techniques are currently being utilized by the Department of Public Safety in assisting private developers to design crime resistant projects and structures in the community.

There still remains a more difficult set of problems to resolve that can only be attacked with positive programs for recreation, reduction of poverty levels, and provisions for jobs and, where necessary, family assistance in order to reduce the necessity for persons to engage in criminal activity.

For the most part, criminal activity in Ceres has been focused at property, rather than at persons. Approximately 20 percent of all actual criminal incidents during 1988 were acts against individuals. The greatest increase in non-person criminal activity involved the theft of household and office goods. Criminal activity will tend to grow with a growing city population if positive programs to combat crime are not implemented.

2. Local Response

The City of Ceres Department of Public Safety currently has 32 sworn officers. The Department has eight patrol vehicles along with seven staff vehicles. The operations of the Department of Public Safety are headquartered in the new Public Safety Building located at 2755 Third Street.

The Department of Public Safety continues to promote and support various crime prevention programs. The activities include neighborhood watch programs, promotion of defensible space through project design review, and installation of security equipment, all aimed at crime prevention.

H. Water Safety

Introduction

The City's water system supplies the entire City of Ceres, except that area north of Nadine Avenue and west of Richland Avenue. The system also provides the fire protection flows for the City. The pressure in the system is maintained by adjusting the amount of water pumped. The system does not contain any water reservoirs. The pressure is maintained through the use of variable speed, and variable frequency pumps. The current water supply meets all state requirements. The City can provide a minimum of 2,000 gallons a minute fire flow at all of its fire hydrants. This is sufficient to meet the fire fighting requirements for residential purposes. Table 3 lists minimum water flow requirement for fire protection.

As stated before, the City maintains pressure within its water system by controlling the amount of water that is pumped into the system. The greater the demand, the more water is pumped. Using this method, the City attempts to maintain a minimum water pressure throughout the system of 40 pounds per square inch (PSI). The normal operating pressure is between 45 and 50 PSI. There are some differences in pressure throughout the system, depending on how close the test point is to a well.

TABLE 3

Minimum Fire Flow Requirements

1. The minimum fire flow for one and two family dwellings shall be 1,000 gallons per minute.

   EXCEPTION: Fire flow may be reduced 50% when the building is provided with an approved sprinkler system.

2. The fire flow for buildings other than one and two family dwellings shall not be less than specified in the table below (as listed in the Uniform Fire Code, 1988 Edition, Pages 424, 425).

FIRE-FLOW GUIDE FOR BUILDINGS OTHER THAN ONE- AND TWO-FAMILY DWELLINGS

FIRE FLOW (Gallons Per Minute)	CONSTRUCTION TYPE				
	I II-F.R.	II ONE-HR. III ONE-HR.	IV-H.T. V-ONE-HR.	II-N III-N	V-N
	TOTAL FIRE AREA IN SQUARE FEET				
1,500	22,700	12,700	8,200	5,900	3,600
1,750	30,200	17,000	10,900	7,900	4,800
2,000	38,700	21,800	12,900	9,800	6,200
2,250	48,300	24,200	17,400	12,600	7,700
2,500	59,000	33,200	21,300	15,400	9,400
2,750	70,900	39,700	25,500	18,400	11,300
3,000	83,700	47,100	30,100	21,800	13,400
3,250	97,700	54,900	35,200	25,900	15,600
3,500	112,700	63,400	40,600	29,300	18,000
3,750	128,700	72,400	46,400	33,500	20,600
4,000	145,900	82,100	52,500	37,900	23,300
4,250	164,200	92,400	59,100	42,700	26,300
4,500	183,400	103,100	66,000	47,700	29,300
4,750	203,700	114,600	73,300	53,000	32,600
5,000	225,200	126,700	81,100	58,600	36,000
5,250	247,700	139,400	89,200	65,400	39,600
5,500	271,200	152,600	97,700	70,600	43,400
5,750	295,900	166,500	106,500	77,000	47,400
6,000	UNLIMITED	UNLIMITED	115,800	83,700	51,500
6,250	"	"	125,500	90,600	55,700
6,500	"	"	135,500	97,900	60,200
6,750	"	"	145,800	106,800	64,800
7,000	"	"	156,700	113,200	69,600
7,250	"	"	167,900	121,300	74,600
7,500	"	"	179,400	129,600	79,800
7,750	"	"	191,400	138,300	85,100
8,000	"	"	UNLIMITED	UNLIMITED	UNLIMITED

Construction Types

(Uniform Building Code 1985 Edition Chapter 17)

I Protected steel, iron, concrete or masonry

II Steel, iron, concrete, or masonry

III Steel, iron, masonry, wood

IV Concrete, wood

V Any fire-resistant material

Planned Improvements

The City is continually constructing new water wells in order to provide a consistent water pressure and flow throughout the City. These wells will provide the flow required to meet the present and future demands within the community. The water system is an integral system and the wells provide back-up in case one of the other wells is down for repairs.

The City is participating in a surface water study to look at the possibility of obtaining surface water in place of the existing groundwater sources. This is being done because of the drop in the current groundwater table within the water basin, and because of changes in the quality of the water and the requirements for drinking water that have occurred.

There exists a serious potential for the degradation of the existing water quality under the City of Ceres, because of a DBCP contamination along the east side of the City. The switch to surface water would eliminate both the effect of the drawdown in the ground water table and the deteriorating quality of the ground water due to chemical contamination.

I. Disaster Preparedness

Disasters can occur at any time and take many forms ranging from a major earthquake to a hazardous material spill, and may involve and affect both property and life. The City's potential for natural hazards has been discussed earlier in this document. The City's potential of man-induced disasters may involve the following existing dangers: Pacific Gas and Electric lines, railroad derailments, freeway vehicular accidents, a break in the jet propulsion fuel line travelling adjacent to the Southern Pacific rail line, and a hazardous material spill within the City and its vicinity.

1. Disaster

The City of Ceres is subject to significant environmental and man-induced hazards which constitute serious threats to life and property. The City's potential for natural hazards can not be prevented. The City's potential for man-induced hazards can be curtailed through intelligent foresight. Although the potential for hazards exist, the magnitude of the effect of both natural and man-induced disasters on life and property can be addressed and a coherent response to such disasters prepared.

The goal of the City is to have a realistic assessment of the potential for a disaster and plans for recovery after a disaster has occurred. Due to the large number of public, quasi-public, and private agencies involved in emergency preparedness planning and their differing areas of responsiblity, cooperation and

coordination between agencies is essential.

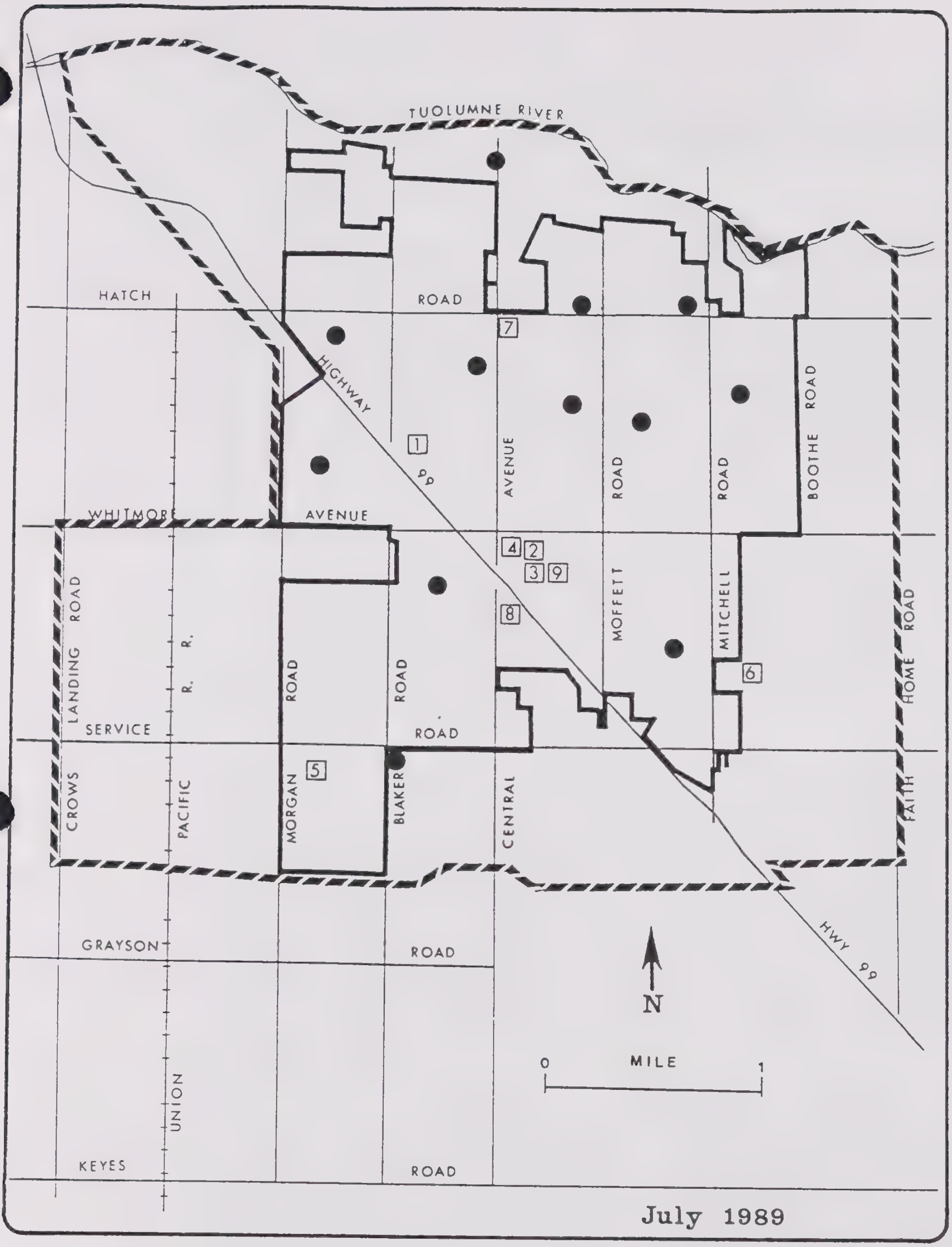
Communications is the critical element in any emergency response capability and must be maintained even in the event of wide ranging disastrous events. Cities, emergency and safety agencies, water districts, utilities, and other involved private agencies must be able to remain in contact in order to coordinate the provision of supplies and personnel. To this end, it is imperative that regular and effective on-going organizational meetings be held in order to assure the efficient and responsive provision of emergency services and supplies.

Provision of essential services and maintenance of critical facilities after a disaster is also critical to saving lives. Critical facilities are those facilities and parts of a community's infrastructure that must remain operational after an earthquake or similar disaster for a community to respond effectively. Examples of critical facilities include hospitals, fire stations, electrical power plants, and community facilities. Map 10 locates critical facilities within the City of Ceres. Ability to repair and/or restore such facilities is essential to recovery. Careful planning and rehabilitation of critical facilities is imperative for ensuring the health, welfare, and safety of the public.

2. Local Response

The development of a carefully conceived emergency preparedness plan includes a disaster operations plan which sets forth the organization and administration of disaster response efforts such as debris removal, evacuation and emergency communications, law enforcement, fire protection and rescue, the provision of health care and for emergency shelter, allocation of emergency food and medical supplies, and the maintenance and restoration of critical services including transportation, water and sewage, electricity, natural gas and telephone service. The County of Stanislaus Office of Emergency Services in conjunction with the City of Ceres have prepared and adopted a comprehensive multi-hazard functional plan to serve as the City's preparedness plan.

The City's Multi-Hazard Functional Plan was adopted in 1986 to address actual emergency situations. In addition, this safety element not only has been developed to meet state law, but is also aimed at reducing death, injuries, property damage through the adoption and implementation of safety goals and policies.



LEGEND

- ☐ CRITICAL FACILITY
- 1 Memorial Hospital Ceres
- 2 Public Safety Building
- 3 Fire District Station
- 4 Ceres City Hall
- 5 Wastewater Treatment Plant
- 6 TID Electrical Substation
- 7 TID Electrical Substation
- 8 Ceres Corporation Yard
- 9 Pacific Telephone Co.
- ● City Water Well

CERES
CRITICAL FACILITIES

J. Air Quality

Air quality within the study area is the product of several factors: setting, climate, and emission of air pollutants.

1) Setting

Stanislaus County is included in the San Joaquin Valley Air Basin, one of 13 air basins created by the State Air Resources Board (ARB). The Environmental Protection Agency has designated both Stanislaus and San Joaquin Counties an an air quality maintenance area (AQMA). Responsibility for air quality maintenance is shared by the Stanislaus County Air Pollution Control District at the local level, ARB and the Department of Motor Vehicles at the state level, and EPA at the federal level.

2) Climate

The climate of San Joaquin Valley Air Basin Area is characterized by mild winters, warm dry summers, an abundance of sunshine and a long growing season. Almost 90% of the seasonal rainfall occurs during the months of November through April.

The prevailing westerly winds of middle latitudes, the orientation of the great valley, and the opening through the Carquines Strait combine to provide Ceres with predominately gentle northwesterly winds for all months of the year except January and February, when prevailing winds are from the opposite direction. High winds are rare, although speeds of 45 mph may be expected once every two years, increasing to around 60 mph as often as once in 50 years. A short wind record from the Modesto City-County Airport suggests that winds are less than 4 mph 10% of the time and less than 10 mph 89% of the time.

Temperatures are equitable. The average temperature for the months of January through July is 59° F. Northwest of the City, towards Carquines Strait, the marine influence becomes more prominent, while southeastward towards the central part of the valley, conditions are more continual. Maximum readings of 100° or warmer are recorded about 14 days each year; 90° readings occur on about 75 days. Temperaturs of 32° or colder occur on 25 days in a typical year.

Daytime relative humidities in summer are low, usually dropping to about 20% or less when afternoon temperatures rise to 90° or above. Winter humidities are often high, with ground fog occurring in December and January. Occasionally, these winter fogs may last as long as a week or more, lifting at times a few hundred feet to form a low overcast. Despite these winter fogs and the cloudiness associated with storm conditions, Ceres enjoys clear skies for much of the year.

3) Air Pollutants

The air quality of a particular area is based upon the type and amount of pollutants being emitted and dispersed. Degrees of air pollutant levels are strongly associated with natural conditions. Often, air pollutants are affected by the humidity, temperature, and flow of the prevailing winds in the air basin.

The major categories, primary and secondary pollutants, are those which are a direct consequence of energy, production and utilization, and those which undergo chemical changes after being emitted, respectively. Smog is a secondary pollutant produced by photochemical reactions involving primary emissions. Primary sources and their pollutants are a direct consequence of the combustion of petroleum and other fuels resulting in the production of oxides of carbon.

Primary pollutants typically affect only local areas and do not have time to disperse and to be chemically modified further. Secondary pollutants are those primary pollutants which do disperse and undergo chemical changes under conditions of high ambient temperatures and high rates of solar insolation. Principal secondary pollutants are termed oxidants and include ozone (O3), peroxynitrates, nitrogen dioxide (NO2), and chemical aerosols.

The Air Resources Board has identified, monitored and recorded the following three pollutants: Carbon Monoxide (CO), Ozone (O3), and Particulate Matter (PM). Appendix C lists recorded air pollutant readings for Stanislaus County. The national ambient air quality standard for Ozone has been exceeded at least for two days each year since 1982. Since 1982, violation of Carbon Monoxide Standards occurred two days in 1985, and four days in 1986. National Standards for particulate Matter were violated only once in 1986 and in 1987, since readings began in 1984.

Conditions of poor air quality affect both humans and the environment. In terms of dollars, as air pollution affects all of the valley's crops, smog is destroying more than $150 million worth of agricultural products each year.

Poor air quality not only harms crops but reduces visibility and lowers the overall quality of life. Chemicals in the air reduce the ability of a healthy person to breathe and can harm the lungs of someone who has asthma or emphysema.

Polluted air can cause even healthy adults to suffer from nausea, headaches, irritated eyes, and dizziness. Children under the age of 14, whose lungs are still developing, and the elderly, whose immune systems have been weakened with age, are especially vulnerable to the damaging effects of smog. Young people under 14 and persons over 65 make up one-third of the California population.

Conditions of smog which have developed in the San Joaquin Valley in recent yers, have led to the creation of acid rain. Higher levels of acidic precipitation add further damage to the environment. The state legislature is currently reviewing a plan to study the effect of acid rain in the San Joaquin Valley. It proposes to identify the types, levels, sources, and effects of acid precipitation in the Central Valley.

4. Local Response

Transportation tatics adopted in the 1982 Stanislaus Air Quality Plan are expected to continue to provide a reduction in Carbon Monoxide Emissions. Transportation tatics include the implementation of the following programs: expansion of carpooling activities, expediting bicycle plans, flexible work hours, traffic signal sychronization, widening of selected streets, removing unnecessary stop signs, and improving transit services where necessary.

Increased urbanization in the Central Valley can lead to higher levels of air pollutants, unless coordinated and increased efforts are assumed to reducing air pollution.

V. SAFETY PROGRAMS

A. Emergency Services Operational Plan

In order to improve the capability of adequately responding to such emergencies as earthquakes, disastrous fires, and civil disturbances, the City of Ceres joined with the County of Stanislaus in adopting a joint action disaster preparedness program. The City of Ceres Multi-Hazard Functional Plan was adopted by the City Council and is updated periodically.

This Plan assigns emergency operating functions to specific agencies and departments and has designated personnel to serve in the command and control role in the context of a widespread emergency. The Plan is very detailed in that it covers all aspects of disasters including health and medical services, law enforcement, traffic control, fire protection, shelter and supply services.

Various cities throughout the county adopted this plan because it is rare that one jurisdiction could attain an adequate level of readiness to conduct life saving operations in extraordinary situations. By pooling resources offered by all cities, a better local program could more easily overcome an unfavorable situation and be eligible for various state and federal programs.

The purpose of being prepared is to safeguard people in case of emergencies. Many times it's a coordinated effort on the

part of local, state, and federal governments working together that overcomes an emergency situation. Existing local government forces form the nucleus of preparedness. The whole concept of emergency readiness can be summed up by saying that all government agencies and all other organizations, must be able to do the right things at the right time. This includes the ability to coordinate the operations of the police departments, fire departments, ambulances, hospitals, medical personnel, and all other people and units able to help citizens under conditions of extraordinary emergency.

B. Codes and Regulations

The following codes have been adopted by city officials for the safety and welfare of residents in the community. Adoption of these codes set forth minimum standards for structures to be better designed and constructed with safety in mind.

Zoning Regulations - ensure that the community's land uses are properly situated in relation to one another, providing adequate space for each type of development. Zoning can direct new growth into appropriate areas and protects existing property from obnoxious and incompatible uses.

Subdivision Regulations - ensure that new residential areas make sufficient provisions for needed public utilities and amenities, and create a safe residential community that will be adequate in years to come.

Health Codes - set forth the minimum standards necessary to ensure a safe, healthy environment.

Building Code - applies principally to new construction and alterations, though it is sometimes made retroactive and applied to existing buildings if past deficiencies are discovered to be critical.

Fire Prevention Code - may govern the maintenance of the building once a building is constructed, and govern the introduction of materials into the building for the sake of fire safety.

Housing Code - concerned with livability standards for sanitation, health facilities and building maintenance.

Electrical Code - sets requirements for materials and equipment used in electrical systems.

Plumbing Code - provides for delivery of potable water and safe disposal of flushed wastes.

Mechanical Code - applies to heating, ventilating, and air conditioning.

Elevator Code - governs materials, equipment and installation of elevators and their use. At the present time, the City does not have an adopted Elevator Code. However, if a development proposed the use of elevators, City Building Officials would require that they comply with adopted State codes on their use and installation.

C. Building Inspection

The City has an active dangerous buildings abatement program which is an on-going process. All public and private buildings which are determined to be extremely likely to lead to loss of life are required to be torn down or to be made structurally safe at the earliest possible date. The abatement procedure process is fair to the owners of the structures by allowing for a reasonable length of time to correct deficiencies.

Health and sanitation is inspected by Health Department officials in conjunction with the Building Department when field inspecting structures for building and fire violations. It is recommended that the City amend the existing investigative "complaint only" policy to an on-going, structurally unsafe, and fire hazardous housing units which are in such condition as not to be repaired or rehabilitated.

The Building Department consists of a building official, a building inspector supervisor, four full time building inspectors, and one building permit technician. Additional personnel will be needed in the future to sustain a consistent level of operation for the safety of citizens in Ceres.

VI. CONCLUSION

The Safety Element was prepared to serve the needs of Ceres, which is primarily a developed area. This element is not intended or designed to stand alone as an independent plan. But, rather it should be viewed in conjunction with all the elements that make up the General Plan as a major part of the overall General Plan. The land use policies of the General Plan are determined by social, economic, and environmental considerations in addition to geologic and safety considerations.

Due to the sudden and unpredictable nature of fires, geologic hazards, flood, and other disasterous situations, it is imperative not only to adopt safety goals and policies, but to implement functional programs which endeavor to secure the highest possible degree of public protection. Such plans and policies must be realistic and consider all segments of the community without socioeconomic bias.

Some factors are beyond man's control; others can be lessened or eliminated. Some hazards can be decreased by government action,

while others must be volunteered by private citizens. Without adequate and competent fire, police and emergency service capabilities at the local level of government, land use functions would constantly be in jeopardy.

VI. IMPLEMENTATION

In the City of Ceres, the following tools are available to effectively implement the Safety Element: zoning ordinance, subdivision ordinance, building, health, and housing codes, inter-agency coordination, public expenditures, street and road improvements and specific plans. Other tools have been used less often or not at all, and many need to be explored further for determination of their value to the City.

As was mentioned earlier, this Element does not stand alone and it does not constitute an independent plan. But rather, it is designed to be part of the overall General Plan for review in accordance with various land use proposals. With the various tools available to the City, this element can play an important part in introducing safety considerations into the planning process. It has been a policy consideration of both the City Council and Planning Commission on various projects in the past to deal with safety considerations such as installation of underground utility services, systematic review of new subdivisions by the fire department, and upgrading of both the sewage and water systems.

An important part of plan implementation is the continual planning process, with monitoring of current trends and changes in plan policies and community desires. As new information becomes available, the plan can be further refined.

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APPENDICES

APPENDIX A

Useful Safety Element Definitions and Information

Critical Facility: Includes facilities housing or serving many people or otherwise posing unusual hazards in case of damage from or malfunction during a earthquake, such as hospitals, fire, police, and emergency service facilities, utility "lifeline" facilities, such as water, electricity, and gas supply, sewage disposal, and communications and transportation facilities.

Fault: A fracture in the earth's crust forming a boundary between rock masses that have shifted.

> Active Fault: A fault that has moved recently and which is likely to move again. For planning purposes, "active fault" is usually defined as one that shows movement within the last 11,000 years and can be expected to moved within the next 100 years.
>
> Potentially Active Fault: (1) A fault that last moved within the Quaternary Period before the Holocene Epoch (the last 2,000,000 to 11,000 years); (2) a fault which, because it is judged to be capable of ground rupture or shaking, poses an unacceptable risk for a proposed structure.
>
> Inactive Fault: A fault which shows no evidence of movement in recent geologic time and no potential for movement in the relatively near future.

Ground Failure: Mudslide, landslide, liquefaction, or the seismic compaction of soils.

Hazardous Building: A building that may be hazardous to life in the event of an earthquake because it:

(1) Was constructed prior to the adoption and enforcement of local codes requiring earthquake resistant design of buildings;

(2) Is constructed of unreinforced masonry; or,

(3) Exhibits any one of the following characteristics:

- Exterior parapets and ornamentation that may fall on passers-by;
- Exterior walls that are not anchored to the floors, roof, or foundation;
- Sheeting on roofs or floors incapable of withstanding lateral loads;

- Large openings in walls that may cause damage from torsional forces; or,

- Lack of an effective system to resist lateral forces.

Hazardous Material: An injurious substance, including pesticides, herbicides, toxic metals and chemicals, liquified natural gas, explosives, volatile chemicals, and nuclear fuels.

Landslide: A general term for a falling mass of soil or rocks.

Liquefaction: A process by which water-saturated granular soils transform from a solid to a liquid state because of a sudden shock or strain.

Seiche: An earthquake-induced wave in a lake, reservoir, or harbor.

Subsidence: The gradual, local settling or sinking of the earth's surface with little or no horizontal motion. (Subsidence is usually the result of gas, oil, or water extraction, hydrocompaction, or peat oxidation, and not the result of a landslide or slope failure).

Surface Rupture: A break in the ground's surface and associated deformation resulting from the movement of a fault.

Tsunami: A wave, commonly called a tidal wave, caused by an underwater seismic disturbance, such as sudden faulting, landslide, or volcanic activity.

Wildland Fires: Fires occurring in a nonurban, natural area which contains uncultivated lands, timber, range, watershed, brush, or grasslands.

APPENDIX B

Overview of
Geologic and Seismic Safety
Stanislaus County

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NATURAL SETTING

Stanislaus County is located just north of the center and equidistant from the eastern and western borders of California. It is bounded by the County of San Joaquin on the north, Calaveras and Tuolumne on the east, Merced on the south, and Santa Clara on the west. The total area is 1,521 square miles, being about 60 miles long and 25 miles wide. While Stanislaus County is commonly considered a Central Valley county, it actually consists of three distinct geographical regions: the San Joaquin Valley, the eastern dissected uplands (low Sierra foothills) and the western mountains (Diablo Mountains). These regions comprise respectively about 67%, 5%, and 28% of the total area. Mount Stakes, at 3808 feet above sea level, is the highest elevation in the County, and at the place where the San Joaquin River leaves the County to the north is the lowest elevation at 15 feet above sea level. The entire County is within the San Joaquin River drainage basin.

GEOLOGIC HISTORY

The geologic history of the Stanislaus area should be viewed first on the basis of world geologic processes and second on a regional basis. Because of their complexity and diversity, only one world process will be introduced. However, in relation to our interests in this report, the chosen process is very important.

In recent years, the age old theory of "continental drift" has been validated. It has been given the more accurate name of "plate-tectonics". The essence of this process is that "plates" (which are usually but not always continents) move in relation to one another over time. For example, the plate (sub-continent) of India has been moving north in relation to the Asian plate, and in the process creating the Himalaya Mountains. North America is moving away from Europe, creating the Atlantic Ocean, and closer to Asia, creating the Coast Ranges and influencing the structure of the San Joaquin Valley and the Sierra Nevada. This process naturally causes great stresses in the earth's crust. When the stress becomes unbearable, an earthquake occurs, often resulting in movement along fractures or faults in the earth's crust.

Ancient Origins of Stanislaus County

The earth is at least 4,600,000,000 (4.6 billion) years old but in Central California little is known about the first 4.4 billion years (96%) of its history. Whatever occurred during this expanse of time (when the interior of the North American continent was being formed) has either been completely destroyed or is buried so deeply in the earth's crust that it can not yet be traced.

During that period of geologic history of from 600 to 200 million years ago, Central California was off the western edge of a large down sinking trough (geosyncline) which was covered by shallow marine seas extending half-way across North America. Over this 400 million years there accumulated in this geosyncline, vast quantities of carbonate sediments (primarily limestone) in places as much as twenty miles thick. Off the western margin of this geosyncline, where Stanislaus County now lies, great quantities of volcanic lava, tuff and clastic sediments were deposited.

Building the Structural Framework - The "Nevadan Revolution"

About 200 million years ago, there began that period in the earth's history that saw the groundwork being laid for all the physical structures in Stanislaus County: the Sierra Nevada, the Valley and the Diablo Mountains. Due partly to the weight of the accumulated sediments, and partly to the moving continental plates, the earth reacted with violent volcanism, folding, faulting and uplifting, especially in that area now known as the Sierra Nevada. This episode is called the Nevadan Revolution.

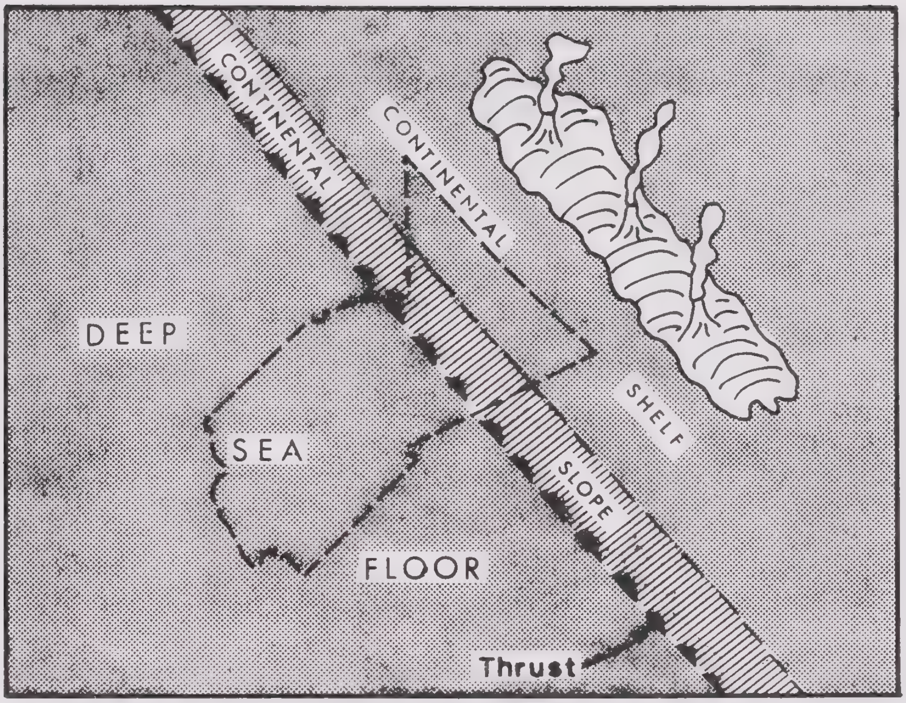
An integral part of this revolution was the formation of expansive igneous intrusions and volcanism (see Geology Map - Jurrasic and/or Triassic Metavolcanic Rocks), leading to the building of the Sierran batholith which is the backbone of this mountain system. Accompanying this development and a result of the tremendous pressures and high temperatures it caused, was a complete alteration of the structure and composition of most of the pre-existing trough sediments which had overlain the intruding granitic batholith. This process, known as metamorphism, produced hard resistant slates, schists and greenstones from the weakly consolidated trough sediments of limestones, shales, sandstones, siltstones, volcanic tuffs and lava.

The Valley remained under deep seas throughout this period (see Figure #1). The only structural change took place far below the surface as the zone of the granitic batholith spread to the eastern edge of the present day Valley. However, as the Sierra uplifted, the natural processes of erosion slowly stripped away at least a ten mile thickness of trough sediments at a rate of about one foot per 1000 years. Most of these sediments were transported by rivers into the Valley. Some remained, filling and deepening the Valley trough, but much continued further westward and settled to a great thickness in that area that was to later become the Coast Ranges.

Formation of the Present Landscape - Events in the Cenozoic Era

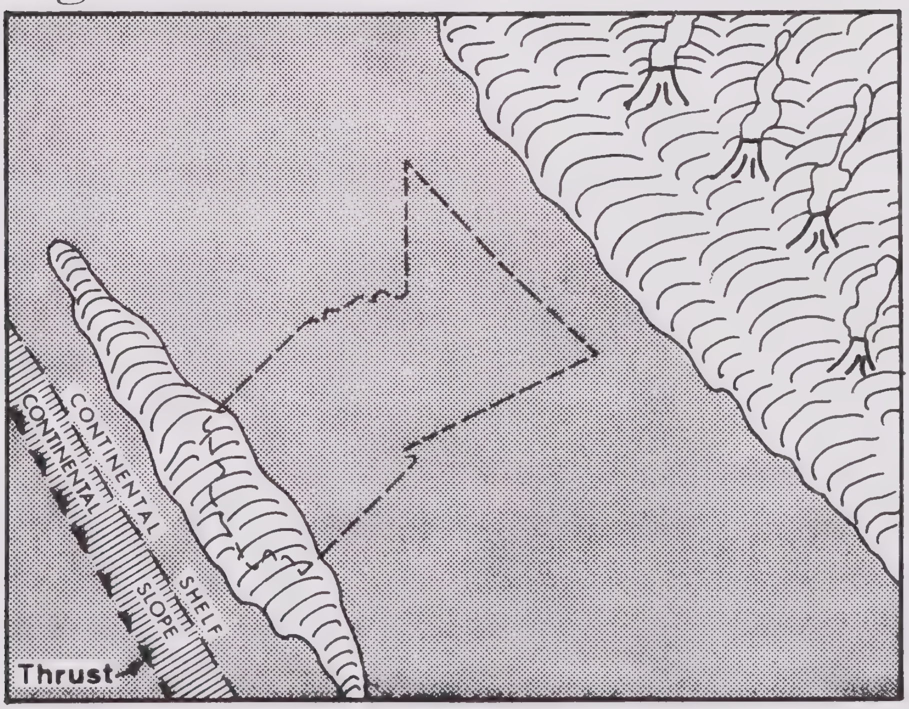
By the early part of the Cenozoic Era (60-70 million years ago), the original uplifted Sierra Nevada has been eroded down to inconspicuous remnants (see Figure #2). During the last thirty million years of earth's history, three events occurred which resulted in the distinctive Sierra Nevada that we know today.

figt. 'e 1



LATE JURASSIC — EARLY CRETACEOUS TIME — 125 to 150 million years ago.

figure 2



NEAR END OF CRETACEOUS TIME — 60 to 80 million years ago.

DESCRIPTION OF THE GEOLOGICAL FORMATIONS IN STANISLAUS COUNTY

RECENT ALLUVIUM - 0 to 5,000 years old - poorly sorted stream deposits of clay to boulder size.

RECENT RIVER AND MAJOR STREAM CHANNEL DEPOSITS - 0 to 5,000 years old - sediments along river channels and major streams including adjacent natural levees.

RECENT ALLUVIAL FAN DEPOSITS - 0 to 5,000 years old - sediments deposited from streams emerging from high lands surrounding Great Valley. Mostly sands and silts. Modesto formation in eastern Stanislaus County.

RECENT BASIN DEPOSITS - 0 to 5,000 years old - sediments deposited during flood stages of major streams in areas between natural levees and alluvial fans.

QUATERNARY NONMARINE TERRACE DEPOSITS - 5,000 to 2,500,000 years old - stream terrace deposits of cobble and pebble gravel, sand, and silt.

PLIOCENE AND PLEISTOCENE NONMARINE SEDIMENTARY DEPOSITS - 5,000 to 7,000,000 years old - Riverbank and Turlock Lake formations in eastern Stanislaus County. Sand shading into pebbly sand and gravel to the east. Forms dissected rolling hills. Tulare Formation including Corcoran Clay in western Stanislaus County. Unconsolidated, crossbedded sand and silt, with minor gravel and clay.

PLIOCENE NONMARINE SEDIMENTARY ROCKS - 2,500,000 to 7,000,000 years old - Mehiten Formation in eastern Stanislaus County. Fluvial and andesitic sand, sandstone, gravel conglomerate, siltstone and clay stone.

UNDIVIDED MIOCENE AND EOCENE NONMARINE - 7,000,000 to 54,000,000 years old - Valley Springs Formation. Dominantly derived from eroded volcanic rocks. White, tuffaceous sand, sandy clay and siliceous gravel.

EOCENE PALEOCENE MARINE SEDIMENTARY ROCKS - 38,000,000 to 54,000,000 years old - Laguna Seca Formations. Quartz sandstone and conglomerate and sandy shale.

UPPER CRETACEOUS MARINE SEDIMENTARY ROCKS - 65,000,000 to 100,000,000 years old - Panoche Formation overlain by Moreno Formation. Shale predominating with sandstone, siltstone and conglomerate.

FRANCISCAN FORMATION - 65,000,000 to 225,000,000 years old - extremely varied sequence of graywacke (predominate), shale, volcanic rocks of submarine orgin, chert and limestone. (Graywacke locally extensively jadeitized.)

MESOZOIC BASIC AND ULTRABASIC INTRUSIVE ROCKS (Volcanic orgin) - 65,000,000 to 225,000,000 years old - Massive serpentine, peridotite, gabbro, hornblende gabbro.

JURASSIC MARINE SEDIMENTARY AND METASEDIMENTARY ROCKS - 136,000,000 to 190,000,000 years old - Mariposa Formation. Slate, particularly metasmorphosed sandstone, graywacke and conglomerate.

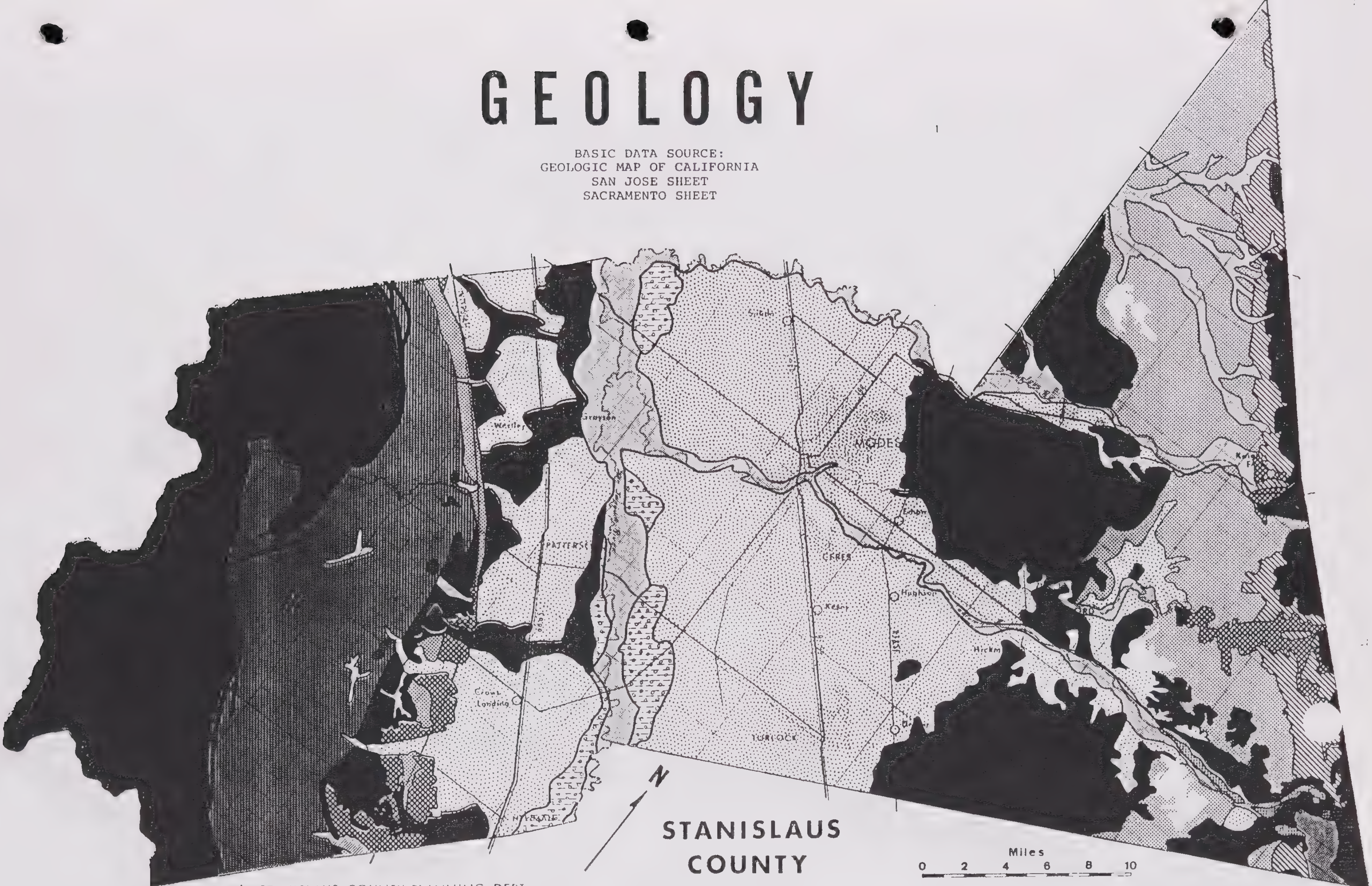
JURASSIC AND/OR TRIASSIC METAVOLCANIC ROCKS - 136,000,000 to 225,000,000 years old - massive partly metamorphosed volcanic rocks.

LEGEND

Qal	RECENT ALLUVIUM
Qsc	RECENT RIVER AND MAJOR STREAM CHANNEL DEPOSITS
Qf	RECENT ALLUVIAL FAN DEPOSITS
Qb	RECENT BASIN DEPOSITS
Qt	QUATERNARY NONMARINE TERRACE DEPOSITS
	PLIOCENE AND PLEISTOCENE NONMARINE SEDIMENTARY DEPOSITS
Pmlc–Pc	PLIOCENE NONMARINE SEDIMENTARY ROCKS
	PLIOCENE VOLCANIC ROCKS
Ec–Mc	UNDIVIDED EOCENE AND MIOCENE NONMARINE SEDIMENTARY ROCKS
	PALEOCENE AND EOCENE MARINE SEDIMENTARY ROCKS
Ku	UPPER CRETACEOUS MARINE SEDIMENTARY ROCKS
	FRANCISCAN FORMATION
	MESOZOIC BASIC AND ULTRABASIC INTRUSIVE ROCKS
	JURASSIC MARINE SEDIMENTARY AND METASEDIMENTARY ROCKS
	JURASSIC AND/OR TRIASSIC METAVOLCANIC ROCKS
	DREDGE TAILINGS
	KNOWN LANDSLIDES
	KNOWN FAULTS

GEOLOGY

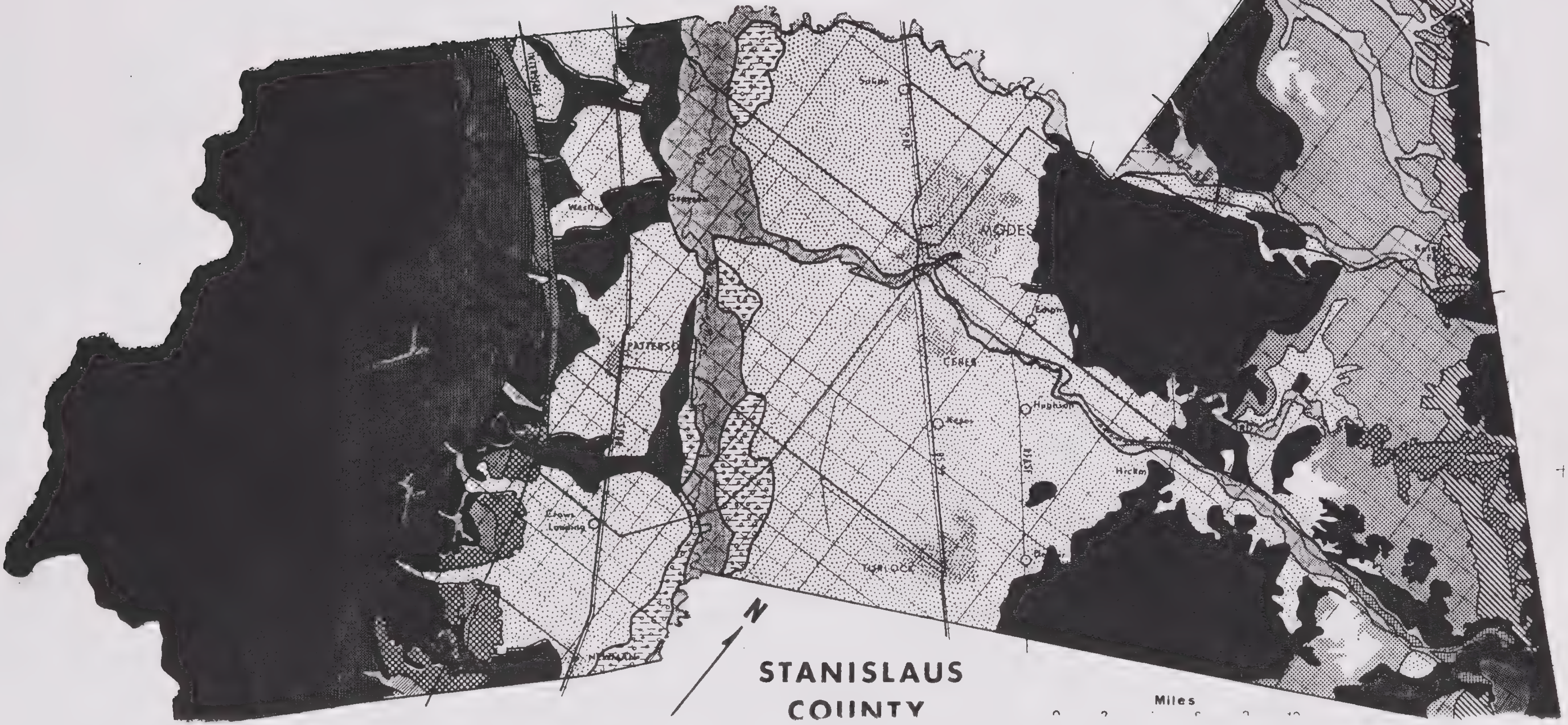
BASIC DATA SOURCE:
GEOLOGIC MAP OF CALIFORNIA
SAN JOSE SHEET
SACRAMENTO SHEET



Prepared by STANISLAUS COUNTY PLANNING DEPT

GEOLOGY

BASIC DATA SOURCE:
GEOLOGIC MAP OF CALIFORNIA
SAN JOSE SHEET
SACRAMENTO SHEET



Volcanism, lasting until about five million years ago, buried the Sierra Nevada with up to 3,000 feet of lava. This thickness decreased toward the west, leaving about 500 feet of lava in the foothills (see Geology Map #1 - Pliocene Volcanic Rocks). In Stanislaus County, these rocks appear as the Tuolumne Table Mountain near Knights Ferry.

In the Pliocene, faulting and uplifting raised the Sierra Nevada to its present majestic height. The westerly Sierra mountain block was uplifted and tilted westward producing the familiar asymmetrical shape of the Sierra Nevada. The eastern block moved downward, resulting in a series of land forms typified by the Owens Valley. Uplifting and faulting continue to this present day.

Another result of this uplift was to renew erosional activity. Mountain streams found new vigor and incised their canyons to depths of 2,000 to 4,000 feet. Glaciation, accompanied by lowering of sea level, occurred periodically. These processes combined to form some of the deepest and most beautiful river gorges in the world.

The geologic history of the Coast Range is extremely complicated and has not yet been agreed upon by earth scientists. The greatest anomaly is that this area does not appear to have developed along the classical lines of mountain building. The Sierra Nevada represents the classical conception by having a single core complex (the granitic batholith) that intruded and thrust through existing overlaying trough sediments. The Coast Range contains two radically different core complexes. Their origin appears to be contemporaneous, in the Jurassic and Cretaceous periods. Wherever they are located side by side, this contract is a fault. Thus, we have the San Andreas fault system which runs for 700 miles in California through the Coast Range and into Mexico. This fault system lies within fifteen miles of the western border of Stanislaus County and about sixty miles from the City of Modesto.

One core complex consists of a granitic-metamorphic rock system (not present in Stanislaus County) and the other is a diverse assemblage of sedimentary and igneous rocks known collectively as the Franciscan formation (see Geology Map - Franciscan formation). The most widely accepted explanation of the fact that these two unrelated rock systems originated at the same time and yet exist side by side is derived from the theory of plate tectonics (see Figure #4). The core complexes originated in different locations; afterwards slip fault movements of up to 200 miles along the San Andreas fault system moved these masses to their present position.

FIGURE #4

GEOLOGIC TIME SCALE

ERAS	PERIODS, EPOCKS	TIME IN MILLION YEARS	EVENTS IN STANISLAUS AREA	LIFE ON THE EARTH
CENOZOIC	Quaternary Recent	0.01	Continued uplift in Diablo Mts. and deposition in Valley.	oldest man. great land mammals.
	Pleistocene	3		
	Tertiary Pliocene	11	Major uplift in Sierra and Diablo Mts marine seas recede from Valley.	
	Miocene	25		
	Oligocene	40		first apes.
	Eocene	60		first placental mammals.
	Paleocene	70	uplift of Stockton Arch, first movement along San Andreas.	
MESOZOIC	Cretaceous	135	Deposition of Franciscan and Great Valley sediments.	Extinction of dinosaur
	Jurassic	180		age of dinosaurs.
	Triassic	225	First major uplift of Sierras.	first dinosaurs.
PALEOZOIC	Permian	270	Most of California under shallow marine seas.	rise of reptiles.
	Pennsylvanian	305		first reptile.
	Mississippian	350		first land vertibrate.
	Devonian	400		fish abundant.
	Silurian	440		trilobites dominant.
	Ordovician	500		first abundant fossils.
	Cambrian	600		
PRECAMBRIAN	Late	1800	Unknown	Oldest fossils.
	Early	2700		First life?
Crust of the earth solidified about 4,000 million years ago.		4500	ORIGIN OF THE EARTH	

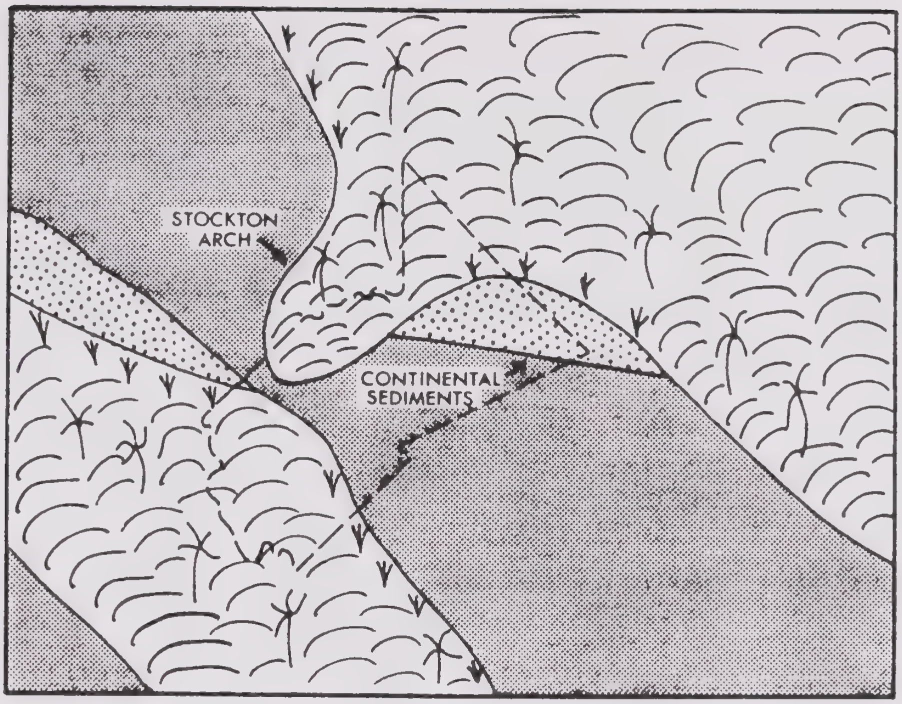
As these two rock groups were developing at great depths in the ocean, a third group was forming in shallow seas to the east. This is the Great Valley group that appears in the Diablo Mountains of Stanislaus County (see Geology Map - Upper Cretaceous Marine Sedimentary Rocks). Beginning about ten million years ago the Franciscan formation began its major uplifting, and in so doing, came into juxtaposition with the Great Valley group. This created the Tesla-Ortigalita fault on the line of contact. The Diablo Mountains and the other Coast Ranges have continued uplifting, folding, and faulting intermittently to this day.

The formation of the present Valley landscape is closely tied to the history of the surrounding mountains, access to the Pacific Ocean and periodic lowerings of sea level. As the surrounding mountains uplifted, erosion caused the deposition of a ten mile thickness of sediment in the Valley trough. The majority of this accumulation in the Stanislaus area took place in the Mesozoic Era. The only surface remnants of these sediments occur in the Diablo Mountains and in one small area called Black Hill in the Sierra foothills (see Geology Map - Upper Cretaceous Marine Sedimentary Rocks). At the beginning of the Cenozoic Era a faulted arch called the Stockton Arch, uplifted in present day San Joaquin and Stanislaus Counties, dividing the Sacramento and San Joaquin Valleys, and lifting the northern Stanislaus area above sea level for a period of 30 million years (see Figure #5). During this time, the eastern part of the Valley received some sediments, probably from flooding (see Figure #5 - continental sediments, and Geology Map - Undivided Eocene and Miocene Non-marine Sedimentary Rocks). The southern Stanislaus area remained under shallow seas and received about 1000 feet of sediment during this time (see Geology Map - Paleocene and Eocene Marine Sedimentary Rocks).

The Miocene-Pliocene uplift of the Sierra Nevada and Coast Ranges also uplifted the Valleys. This spelled the end to the marine seas which had covered the Stanislaus area for millions (and perhaps billions) of years. With the uplift and with periodic glaciation in the Sierra Nevada, there was renewed erosional and volcanic activity in the mountains and deposition of these sediments in the Valley (see Figure #6).

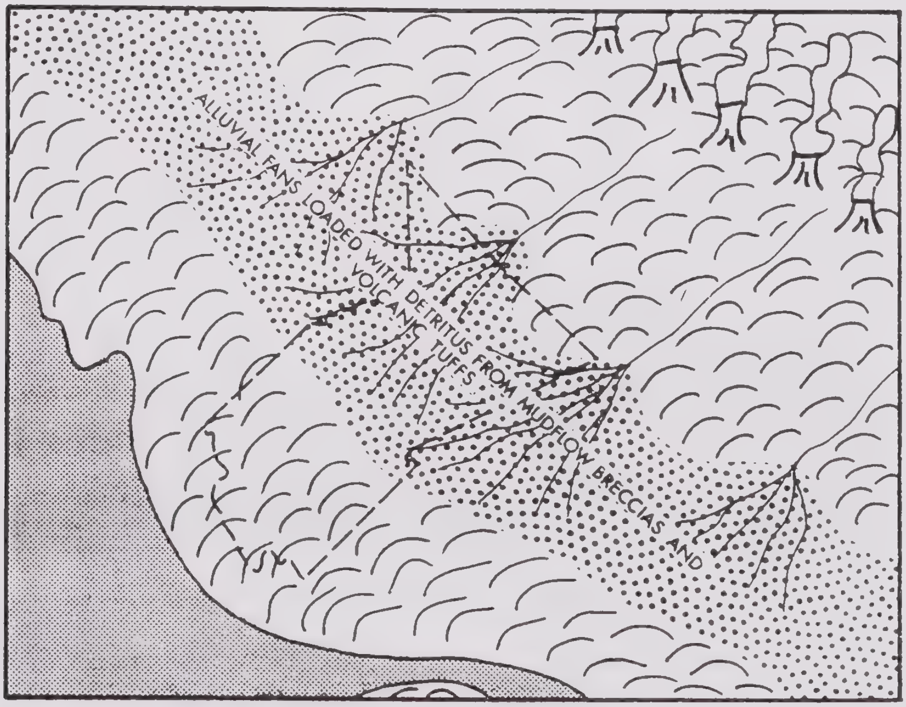
During the early Pleistocene the Valley's outlet to the sea was cut off by movement along the San Andreas fault. This resulted in a great silting up of the Valley (see Figure #7). During the late Pleistocene and Holocene time, the periodic lowering of sea level due to glaciation caused the erosion of much of this alluvial silt. Deposition of young alluvial sediments in the central portion of the Valley was the result (see Geology Map - Recent Alluvial Fan Deposits).

figure 5



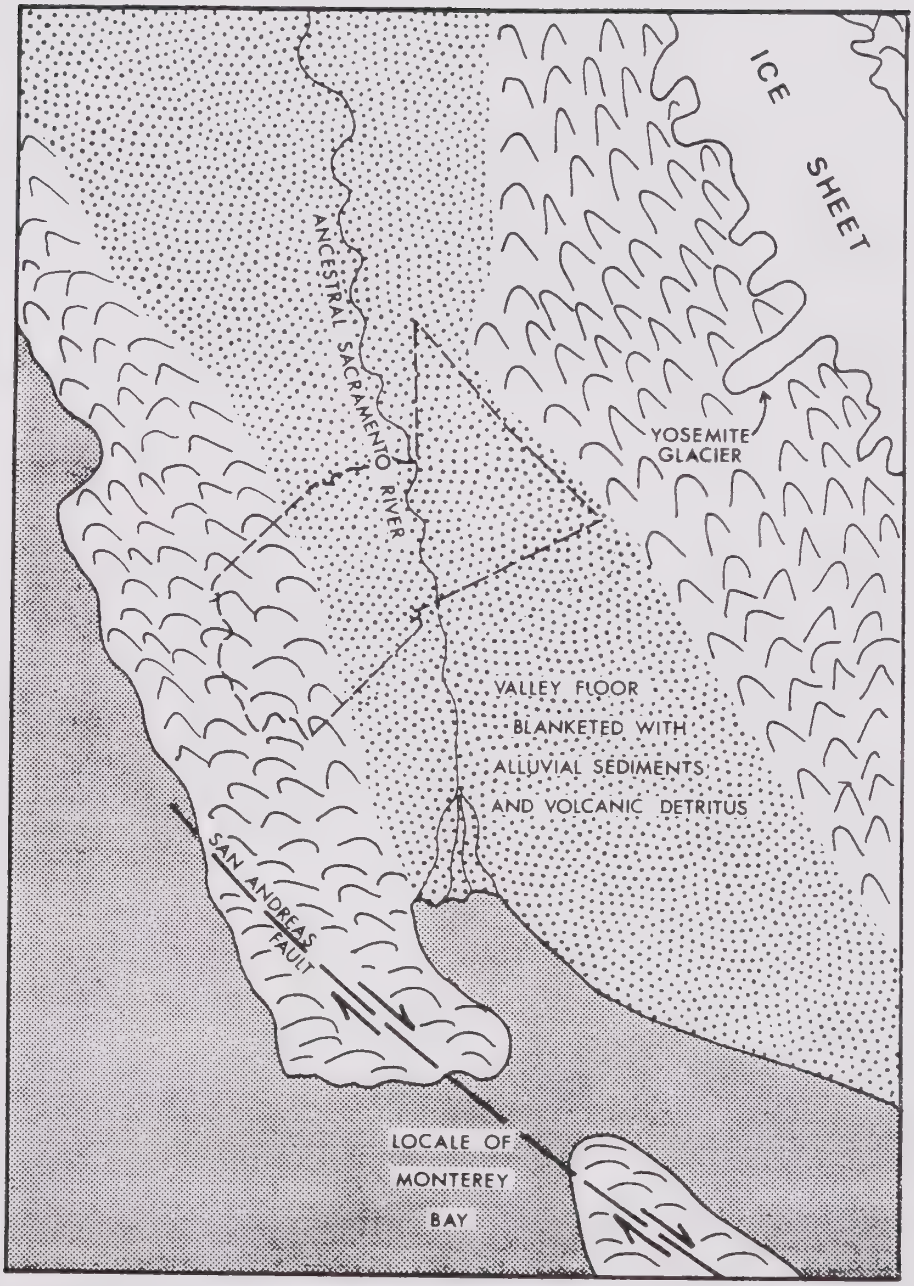
NEAR END OF EOCENE TIME — 35 to 40 million years ago.

figure 6



MIDDLE MIOCENE — EARLY PLIOCENE TIME — 10 to 20 million year ago.

figure 7



EARLY PLEISTOCENE TIME — 2 to 3 million years ago.

MINERAL RESOURCES

Stanislaus County is not rich in mineral resources. It has among the lowest dollar value in mineral production of all counties in mineral rich California. As can be seen from Figure #8, total mineral production in recent years has flucuated between one million and one and a half million dollars.

Gold

Large scale placer mining for gold ended in Stanislaus County in 1952. Since that date gold production has come as a by-product of various sand and gravel operations. The Quaternary gravels along the Stanislaus River along Oakdale and the old Tertiary channels of the Tuolumne River above Waterford were the most productive. Gold production of the county from 1880 through 1959 was 365,000 ounces, most of this coming from the Tuolumne River area. Platinum and silver has been recovered along the Tuolumne River as a by-product of placer gold mining.

Clay

Clay is a residual material, being what is left after the more soluble constituents of the original rocks are leached out. The clay deposits in Stanislaus County originated further to the east. The warm, moist, semi-tropical climate that prevailed throughout the area during parts of the Paleocene and Eocene Epochs was necessary for clay formation. The clay material was eroded from its place of origin and deposited in lagoons, swamps and along the adjacent margins of the shallow seas that existed in Stanislaus County during this time. There are four producing clay pits at present, located between Cooperstown and La Grange. Most of the quarried material is fire clay, but some is china and ball clay.

Sand and Gravel

The Tuolumne River has been the major source of sand and gravel in the County. Stream bed and flood plain deposits extend from Empire to Waterford, a distance of about eight miles. Deposits along this stretch are restricted to the narrow active flood plain which is about 100' in width. Adjacent terraces contain gravel at depth, but the overburden of soil and other sediments makes quarrying prohibitive at this time. Above Waterford for about five miles, the flood plain has an average width of 1/4 mile. Gravels extend to a depth of over 70 feet in places in the stream bed. Easterly to La Grange gold dredge tailings from placer mining are present and are between 1/4 and 1/2 mile in width and have a thickness of at least 30 feet.

On the Stanislaus River, sand and gravel deposits are present in the floodplain and on older terraces between Riverbank and Knights Ferry. The floodplain has a width of about 100 feet, while terraces extend up to one mile in width.

VALUE OF MINERAL PRODUCTION IN STANISLAUS COUNTY 1963 - 1968

sand & gravel	$1,077,087	$1,458,000	$1,322,000	$1,459,000	$1,137,000	$1,425,000
clay	*	21,157	21,921	23,269	16,656	*
lead				*	29,750	
gold	2,425	*	1,680	*	3,430	*
silver	9	*	6	*		
copper				*	115	
other	13,742	4,953		26,607		20,206
TOTAL	1,093,253	1,484,110	1,345,607	1,508,876	1,187,703	1,445,206

* included in "other"

Source: Mineral Information Service, a publication of the California Division of Mines and Geology

FIGURE #8

The San Joaquin River ; numerous isolated areas shallow river-wash. These deposits are mostly fine grained sands and gravelly sands. There is no commercial quarrying.

Orestimba Creek has floodplain and alluvial fan deposits extending for about five miles between Interstate 5 and State Highway 33. Width ranges from 200 feet to 2,000 feet, while depth is up to 100 feet. There is no overburden.

On Garzas Creek there are streambed deposits which extend about one mile into Stanislaus County. These are shallow and narrow deposits.

The costs of transporting sand and gravel materials requires that excavation and processing be located as close as possible to the user (mostly urban areas). Mainly for this reason, eight of the twelve excavation sites are within 12 miles of Modesto.

Gold dredge tailings are located on both the Tuolumne and Stanislaus Rivers in eastern Stanislaus County. The gold dredging operations have resulted in segregated masses of fine gravel and sand overlain by masses of cobbles and boulders. They are excellent sources of sand and gravel for almost all uses.

Unfortunately, the tailings are located at a greater distance from urban centers than other sand and gravel deposits in Stanislaus County, making them less economical to use. But this does not mean that policies cannot be implemented so as to gradually utilize these tailings. The utilization of these tailings would eventually provide for five square miles of land that could be allowed to naturally go back to riparian habitat.

<u>Diatomite</u>

Diatomite is the commercial name for a unique sedimentary rock called diatomaceous earth. The deposits in Stanislaus County are composed of billions of fossils, mainly diatoms, that lived in the marine seas 80 million years ago. Diatomite has certain properties which make it an excellent medium for the rapid filtration of industrial solutions. Some nearly pure deposits are located in Stanislaus County in the southeastern part of the Diablo Mountains. Exploitation of some of these deposits have been attempted, but no sustained operations have developed.

<u>Oil and Gas</u>

Numerous wells have been drilled in Stanislaus County in search of oil and gas, but presently none are producing commercially. The Pliocene and Miocene marine sands which have proved to be the most productive petroleum sediments further south in the Valley, are largely absent in Stanislaus County. Petroleum production in Stanislaus County will probably have to come from older sand horizons. An extension of the Vernalis Gas Field in San Joaquin County underlies a portion of north central Stanislaus County. With known oil and gas fields abundant throughout the Central Valley, it is possible that the intensive worldwide search for these resources will reveal commercial deposits in Stanislaus County. With known oil and gas fields abundant throughout the Central Valley, it is possible that the intensive worldwide search for these resources will reveal commercial deposits in Stanislaus County.

Other Minerals

A variety of minerals are present in the ultrabasic rocks and Franciscan formation of the Diablo Mountains. Nearly a million tons of magnesite were recovered from mines in the Red Mountain District between 1905 and 1945. Since the end of World War II, however, efficient recovery of magnesia from dolomite and sea water has forced the closure of all magnesite mines in California. High grade cromite has been mined intermittently, producing over 5,000 tons of this ore. Cinnabar, the principle ore of mercury, has been found in several areas, but total production has amounted to only a few hundred flasks of mercury. Manganese is an important mineral in the production of pig iron and other ferrous metals. The Buckeye mine in Stanislaus County produced manganese sporadically until 1945. In 1943, a dry concentrating plant was built near Patterson to process the ore from Buckeye, but closed down at the end of World War II. The deposits in Stanislaus County are low grade and except during wartime when foreign sources are closed off, there is little inducement to develop them. Other minerals found in Stanislaus County include gypsum, bementite, braunite, hausmannite, inesite, psilomelane, pyrolusite and rhodochrosite.

Conclusions

The continued viability of the mineral extraction industry in Stanislaus County is partly dependent upon controlling competing land uses which would prevent or hamper excavation operations. This is particularly true for sand, gravel and clay operations where relatively large land areas are involved. Because of the limited geographic occurrence of these minerals and the economic distance factor in sand and gravel operations, it seems necessary that this environmental plan provide protective management for these vital resources. Land use and land division controls need to be adequate for this protection. In addition, public policies are needed that will look to the future rehabilitation of these areas when the extraction process is completed.

Policies that discourage abuses of mineral production lands will become more important as population increases, economic activities intensify and more pressures are put on the natural resource base of Stanislaus County. Possible erosion and the resultant increase in steam sediment load requires careful management. The minimum of mercury must be carefully regulated to prevent this poisonous mineral from polluting surface and ground water supplies.

GEOLOGIC HAZARDS

Natural conditions of geologic structure, landforms, climate and hydrologic regime have interacted to create areas in Stanislaus County where it is hazardous for people to venture with certain of their activities. All living things in these areas can be influenced by these hazards, but human beings, in particular, by their manipulation of the environment are potentially most affected. Human activities have the capacity to negatively influence a naturally unstable landscape and in so doing compound the hazard.

It is the purpose of this section to examine the scientific data relevant to landsliding and mudsliding in the Diablo Mountains of Stanislaus County and to determine land use policies that are consistent with this evidence. Seismic hazards are investigated in the following section.

Natural Slope Stability

The amount of landsliding and mudsliding an area experiences is dependent upon the natural stability of the slopes in the area. The natural stability of any slope depends upon four factors: 1) characteristics of the rock type such as grain size, shape and cementation; 2) structural elements present in the area such as faults, joints and general uplift; 3) geomorphic factors such as slope angle, stream pattern and characteristics of weathering and erosion; 4) hydrogeologic conditions such as groundwater level and permeability.

Diablo Mountains

Investigation of the Diablo Mountains reveals a wide variety of rock types, structures, geomorphic and hydrogeologic characteristics. Basically, two different rock types exist: a) a diverse assemblage of sedimentary, metamorphic and volcanic rocks known collectively as the Franciscan formation, and b) a relatively homogeneous group of sedimentary rocks known as the Great Valley sequence. Most of the Franciscan rocks have been deformed and broken up to such an extent that no structural order remains. This is known as melange. The nonstructural assemblage or melange is the result of massive westward gravity, landsliding and structural thrusting.

Many of the knobby hills in the Franciscan melange consist of exotic structural blocks of hard resistant rocks (chert, glaucophane schist, serpentinite, graywacke). The size of the blocks varies from one foot to over a mile in length. Surrounding the resistant rocks are nonstructural sedimentary rocks, mostly shales. The resistant rock, in some cases, provides a foundation for the hills and acts as a deterent to massive sliding.

The angle of slope of most of this terrain is over 25%, and slopes of 40% are not uncommon. A recent geological reconnaisance of the area by the California Division of Mines and Geology determined that the angle of slope that exists in some areas visited is probably the critical angle of slope. This means that if the angle is increased by human activities or if other natural conditions are disturbed (such as groundwater table, composition of groundwater as modified by fertilizer or sewage), landsliding and mudsliding will result. Forrest Bacon, the geologist who conducted the survey, says in his report,

> My personal experience and the experience of many others, in working with the Franciscan formation, has shown that any interference with the delicate natural balance between such factors as natural slope angle, ground water, vegetation, and surface loading, will often produce disasterous results, particularly with respect to areas underlain by melange matrix. Roadways built over melange terrain are subject to constant repair due to undercutting of natural slopes, which causes slope failures in the weak, internally sheared and slickened matrix material. Differential settlement across matrix-inclusion boundaries is a common problem, as is downhill creep of foundations on matrix materials. Introduction of extra amounts of water into the low permeability matrix material acts to lubricate the multitude of internal shear plane surfaces and causes slope failure. Removal of vegetation destroys the network of roots which act to bind the weak materials together, and also changes the natural infiltration of moisture. All of these factors operate to some extent in other terrains, but are multiplied in importance where melange units are concerned.
>
> In the area of our reconnaissance survey, a number of old landslides and several very young landslides were observed. Where the single lane, unpaved road cuts into melange matrix, a continuing sliding problem exists.

On a scale of six, which the California Division of Mines and Geology uses to rate the potential for landsliding, most of the Franciscan formation in Stanislaus County is rated five, or next to the highest in landsliding potential. The remainder is rated six.

The Great Valley sequence is composed of rocks that have more internal continuity than the melange units of the Franciscan formation. The rocks are interbedded sandstones and shales. The predominant structural feature is a homocline of steeply east-dipping beds. The natural angle of slope is generally over 25%. While this rock group is less susceptible to sliding than the Franciscan, landsliding is common especially adjacent to the Tesla-Ortigalita fault and to streams and road cuts. On the Division of Mines and Geology's scale for landslide potential, most of the Great Valley's sequence in Stanislaus County is rated three; the remainder is rated four.

Conclusions

This brief regional examination of the natural slope stability (or instability) of the Diablo Mountains is necessarily sketchy. It is impractical to do a detailed survey using engineering methods to determine the precise degree of stability for each part of the Diablo Mountains. However, landsliding in this area is common and widespread, and by taking those factors of rock type, structure, geomorphology, hydrogeology and the natural processes associated with them, much insight is gained about the general stability of the terrain.

The introduction of human activities to this area can only impose more stress than natural processes, thereby increasing the instability. Forrest Bacon concludes:

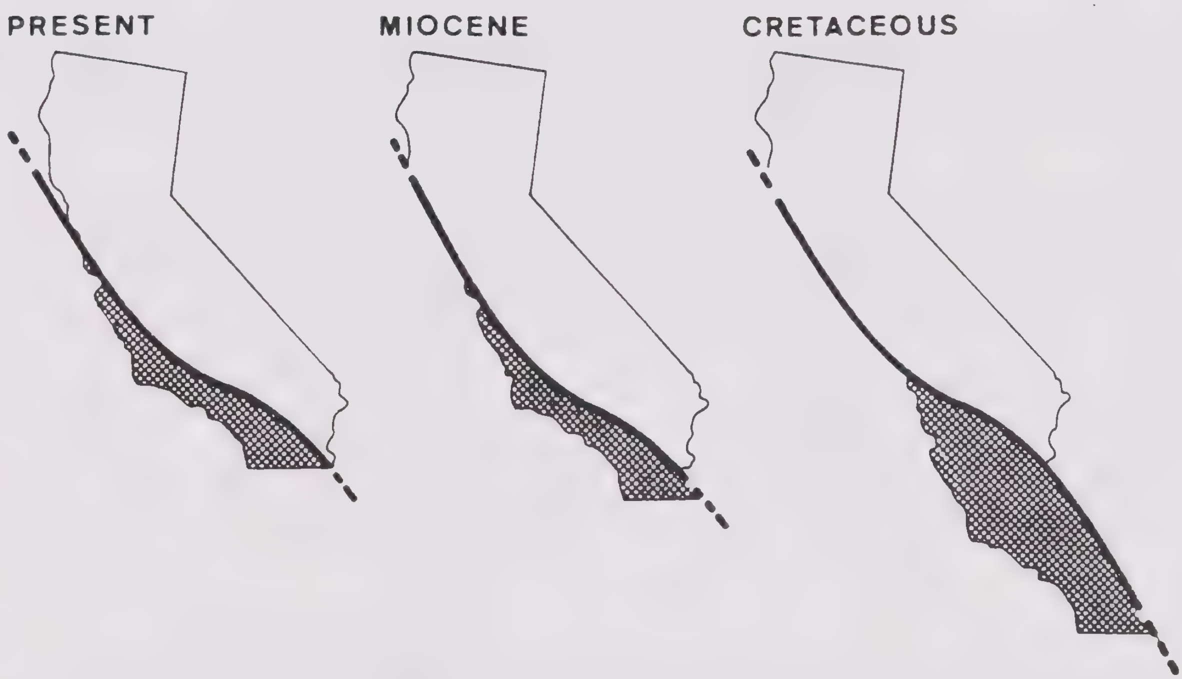
> Although it is possible to locate structures or improvements on melange terrain with satisfactory results, this can usually be accomplished only by very careful consideration of all the geologic factors involved in each individual site. A building located on an extensive flat terrain surface, or valley floor, might prove satisfactory, while one on a comparatively gentle slope, over melange matrix, may be a complete failure. A careful geologic survey of each construction site should be considered essential if any development is allowed.

SEISMIC HAZARDS

California is the most seismically active area in the United States. It is located in the circum-Pacific earthquake zone, which is a result of the process of plate tectonics earlier touched upon in this report. As powerful earth processes push North America further from Europe and Africa and into the Pacific plate, great stresses are encountered at the continental margin. This stress is relieved as a portion of the earth's crust breaks (faults), creating an earthquake. In California an additional element in this process is present. An area of land which was once part of Mexico (the Baja sub-plate) is slowly being pushed northward along the entire north Pacific Ocean. Where this land mass meets the North American plate the San Andreas fault zone has been created. The Baja sub-plate has moved northward 200 miles in relation to the North American plate during the last five million years. This movement is continuing, probably at a rate of no more than one centimeter per year (See figure # 9).

This section will examine evidence concerning the possibility of loss or injury to life and damage to property in Stanislaus County due to an earthquake. Measures that are now being taken by government to lessen or prevent injury and damage will be analysed as to adequacy. Where inadequacies exist, new policies will be recommended.

FIGURE #9



This series of maps shows the movement of the Baja sub-plate northwestward along the San Andreas fault. During the last 200 million years, Baja has moved 350 miles in relation to the rest of California. This movement is accompanied by earthquakes as stresses of movement between these two land masses are relieved.

Types of Earthquake Damage

The most widespread effect of an earthquake is ground shaking. This is usually (but not always) the greatest cause of damage. Structures of all types, including public utility facilities and dams, if inadequately constructed or designed to withstand the shaking force, may suffer severe damage or collapse. The vast majority of deaths during earthquakes are the result of structural failure due to ground shaking.

A second effect of earthquakes is ground failure in the form of landslides, rock falls, subsidence and other surface or near surface ground movements. This is often the result of weakly structured geologic formations or of complete loss of strength of water saturated sub-surface foundation soils (liquefaction).

A third damaging effect of earthquakes, and one that is vastly overrated in importance by many people, is ground displacement along faults. Such displacements of the earth's crust may be vertical, horizontal or both and may offset the ground several tens of feet.

Another damaging effect of earthquakes is seiches. These are waves in lakes or reservoirs due to tilting or displacement of the bottom or margin of the water body. Seiches occur with little warning. The failure of dams due to shaking, faulting or overtopping, as from seiches or massive landsliding into the reservoir, can be particularly disasterous.

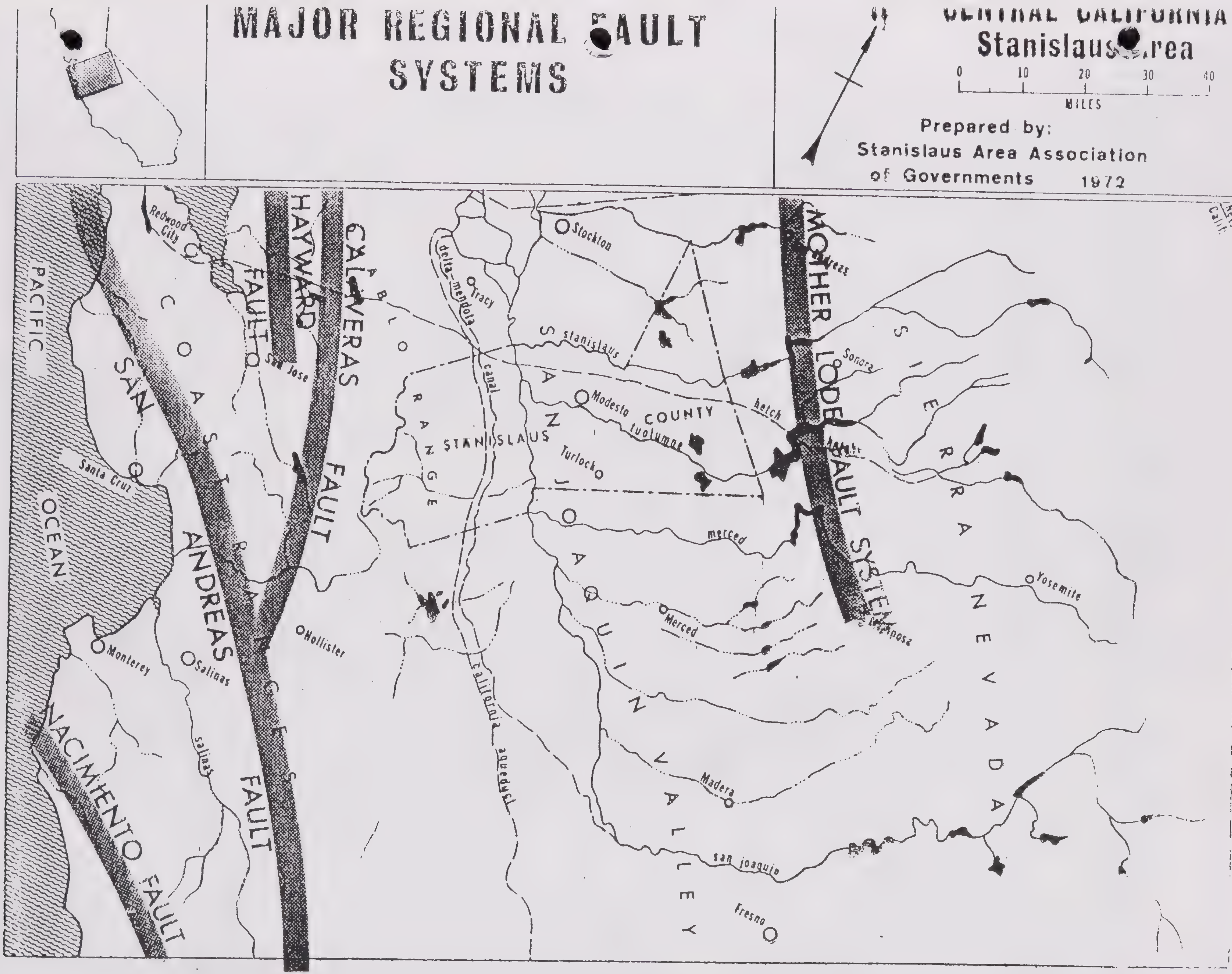
Hazards from the Sierra Nevada

The principle seismic hazard from the Sierra Nevada is the overtopping or destruction of dams with the resulting floods in the Valley. Four aspects of this hazard were examined: 1) the possibility of a damaging earthquake along the Bear Mountain or Melones fault systems, 2) the possibility of a damaging earthquake in a more distant location, 3) the safety of the dams and 4) landslide potential near reservoirs.

1. The most recent geological investigations indicate that most of the earthquake activity along these faults took place 150 million years ago. They are believed to be relatively inactive at present (maps 2 and 3).

2. All of the dams that pose a possible threat to the Stanislaus area, except those located on the upper San Joaquin River, are in an area where the probable maximum intensity of an earthquake is VI or VII (see map #4). Those on the upper San Joaquin River River are in an area where the probable maximum intensity is VIII (see figure #10 for explanation of intensity ratings).

MAP #2

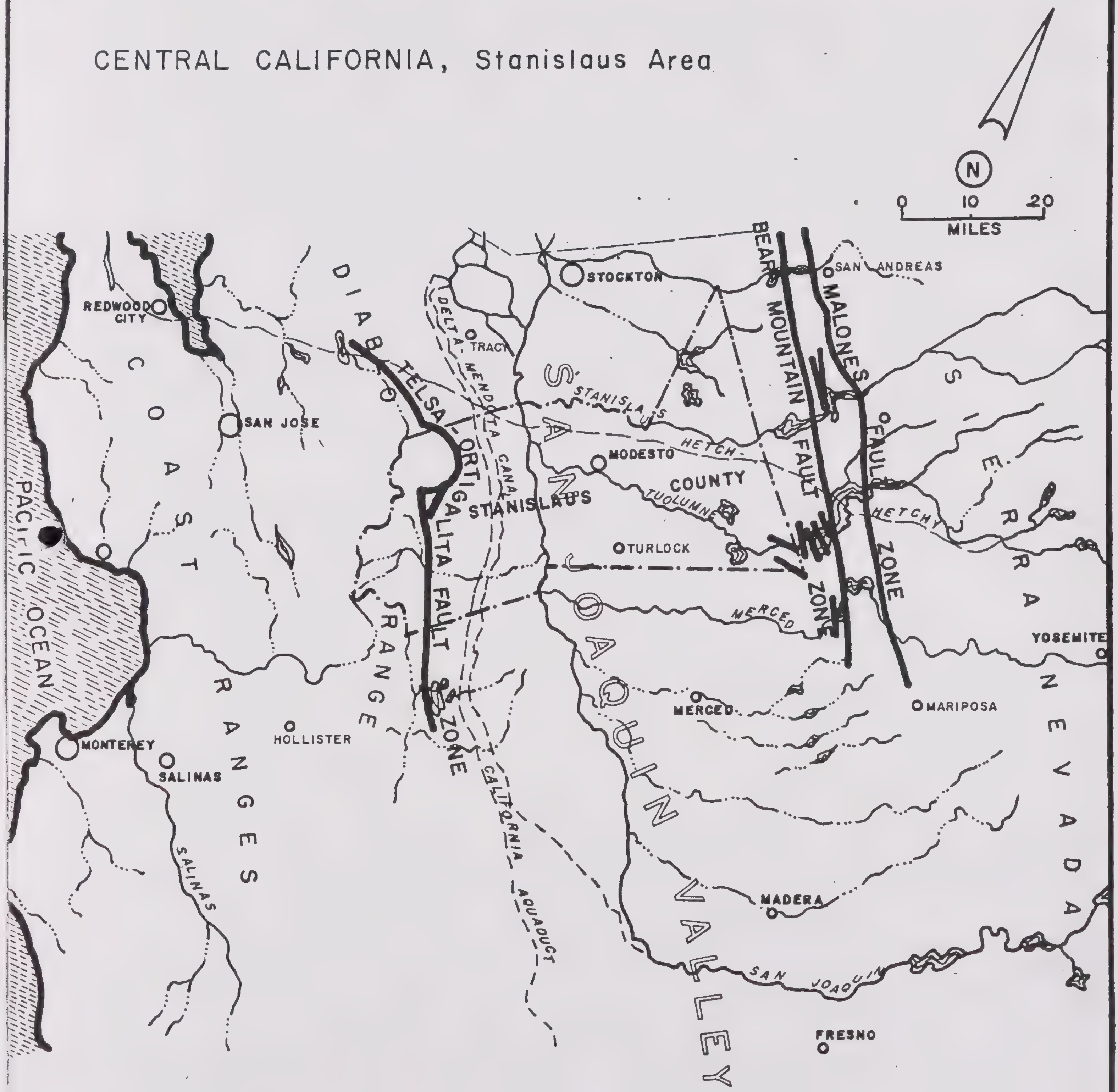


MAJOR REGIONAL FAULT SYSTEMS
CENTRAL CALIFORNIA
Stanislaus Area
0 10 20 30 40
MILES
Prepared by:
Stanislaus Area Association of Governments 1972
PACIFIC OCEAN
SAN ANDREAS FAULT
HAYWARD FAULT
CALAVERAS FAULT
NACIMIENTO FAULT
MOTHER LODE FAULT SYSTEM
COAST RANGES
DIABLO RANGE
SAN JOAQUIN VALLEY
SIERRA NEVADA
STANISLAUS COUNTY
Redwood City
San Jose
Santa Cruz
Monterey
Salinas
Hollister
Stockton
Tracy
Modesto
Turlock
Merced
Madera
Fresno
Sonora
Yosemite
delta-mendota canal
california aqueduct
stanislaus
tuolumne
merced
salinas
san joaquin
hetch

B - 26

REGIONAL FAULT ZONES OF DIRECT SIGNIFICANCE TO STANISLAUS COUNTY

CENTRAL CALIFORNIA, Stanislaus Area



MAP #3

PREPARED BY: STANISLAUS AREA ASSOCIATION OF GOVERNMENTS, 1972.

FIGURE #10

MAGNITUDE - THE RICHTER SCALE

Magnitude is a measure of the energy release of an earthquake. The Richter scale is the most common way of state the energy release. It is a logarithmic scale where a rating of 8 represents an energy release 32 times greater than a rating of 7 and 1,000 times greater than a rating of 6. A quake of magnitude 2 is the smallest quake normally felt. Earthquakes with a Richter magnitude of 7 or more are commonly considered to be major. The highest recorded energy release by an earthquake is 8.9. The great San Francisco earthquake of 1906 had a magnitude of 8.25.

INTENSITY - MODIFIED MERCALLI INTENSITY SCALE OF 1931

Intensity rating is a measure of the effects of an earthquake on people and objects, as determined by experienced observers. The most common intensity scale is the Modified Mercalli Intensity Scale of 1931. The intensity of an earthquake is a result of many factors: magnitude of the earthquake, distance from epicenter, local geological conditions, and structural properties of buildings.

Following is a summary of the effects that each intensity will have. The map entitled "Earthquake Intensity" graphically displays, according to existing knowledge, the probably maximum intensity that can be expected in the Stanislaus area.

I. Not felt except by a very few under specially favorable circumstances.
II. Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III. Felt indoors, especially on upper floors, but many people do not recognize it as an earthquake. Standing vehicles may rock slightly.
IV. During the day, felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make creaking sound. Standing vehicles rock noticeably.
V. Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken. A few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles and other tall objects sometimes noticed. Pendulum clocks may stop.
VI. Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
VII. Difficult to stand; everybody runs outdoors. Slight to moderate damage to well-built ordinary structures, considerable in poorly built structures.
VIII. Considerable damage in ordinary structures; great in poorly built structures. Heavy furniture overturned.
IX. General panic. Damage considerable in specially designed

structures; great in ordinary structures with partial collapse. Buildings shift off foundations. Ground cracked; underground pipes broken.

X. Most masonry and frame structures destroyed. Ground badly cracked. Landslides considerable from river banks and steep slopes. Serious damage to dams, dikes and embankments.

XI. Few, if any, masonry structures remain standing. Bridges destroyed. Rails bent greatly. Underground pipelines completely out of service.

XII. Damage total. Waves seen on ground surface, lines of sight and level distorted. Objects thrown into the air.

3. Within the Department of Water Resources of the State of California is the Division of Safety of Dams. It is their duty to yearly inspect all dams in the State that are not under Federal jurisdiction. Their investigation in 1971 revealed that of the dams that would threaten the Stanislaus Area, all except one met their safety standards. The one dam that did not qualify was Woodward Dam, a hydraulic fill type dam. All hydraulic fill dams in the State are undergoing detailed safety investigations. The Woodward investigation is not yet complete. If it reveals weakness, the State will require stengthening. The dams under Federal jurisdiction all meet Federal safety standards.

4. Because of the numerous reservoirs that pose a threat to the Stanislaus Area and because of the numerous geological formations with varying structure, rock type, geomorphology and hydrogeologic conditions that these reservoirs are built on, only a very cursory examination of landslide induced seiches was made. Landsliding is common on the walls of canyons in the Sierra Nevada, especially within the sedimentary rocks that compose the foothills of Calaveras, Tuolumne and Mariposa Counties. The dams in this area of landsliding are Tulloch, Melones, Don Pedro and Exchequer. In the upper San Joaquin River area the geologic structures is more firm and landslides are less prevelant.

Even though both Federal and State design and safety standards take into account the probable maximum earthquake intensity and to some extent the possibility of earthquake induced seiches, there remains the remote possibility of dam failure or seiche overflow. Recognizing this, the State Legislature recently passed legislation requiring maps be prepared for all dam owners showing the extent of possible flooding in case of failure. These maps are not yet available. When they become so, further evaluation of dam safety and emergency preparation will be required.

Hazards in the Valley

The valley portion of the Stanislaus Area when compared with the Sierra Nevada and the Coast Ranges is relatively free of direct seismic activity. The only earthquake epicenter recorded in or near this area was in San Joaquin County adjacent to the Sierra foothills. This earthquake took place on April 10, 1881 when an intensity of VII was felt in Modesto. The principle seismic hazard in the Valley is structural damage resulting from a distant earthquake.

Earthquake activity in many areas of California and Nevada can cause structural damage throughout Stanislaus County. With the San Andreas fault system to the west, the Garlock fault system to the south and the Owens Valley, Carson Valley and Honey Lake fault systems to the west and north, the Stanislaus Area is virtually surrounded by high activity earthquake zones.

The probable maximum intensity from an earthquake ranges from a low of VII in the eastern Stanislaus area to a high of X in the Newman area. Oakdale should anticipate an intensity of VII, while Modesto, Turlock, Riverbank, Waterford, Patterson, and Ceres should anticipate an intensity of VIII.

During the San Francisco earthquake of 1906, the Stanislaus area experienced severe ground shaking. Records show that structural damage in some places was severe. A seismiological report from Modesto records:

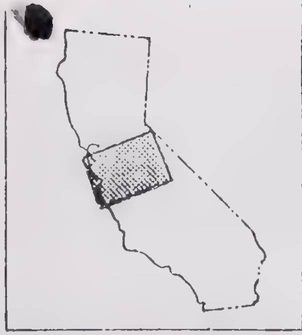
> Cracks developed in the Stanislaus County Courthouse, several downtown buildings and the Tyron Hotel. The 14th Street School on "H" Street was condemned because of cracking. Railroad water tanks toppled. A man said, "Look outside at those trees," as a line of trees jogged.

This distant earthquake with its epicenter over 100 miles from Modesto, produced an intensity there of VII. A future earthquake of greater intensity is probable. In Newman, the intensity was VIII (see map #5).

An an indication of the frequency of damaging earthquakes, the eastern part of Stanislaus County has experienced 1 to 5 earthquakes with an intensity of VI or above in the period 1810-1969, while the western part of the County has experienced 6 to 10. Figures show that Modesto has had two of intensity VII, two of intensity VI and 35 of lesser intensities during the years 1850-1969 (see figure #11).

<u>Diablo Mountains</u>

There are three principle seismic hazards in the Diablo Mountains. These are: a) structural damage caused by earthquakes, b) landslides caused by earthquakes and c) dam destruction or overtopping caused by earthquakes. Four aspects of these hazards were investigated: 1) the natural slope stability of the various geologic formations, 2) the possibility of earthquakes along the Tesla-Ortigalita fault zone, 3) the possibility of structural damage and landsliding due to an earthquake in a more distant location and 4) the possibility of dam failure at San Luis Reservoir and O'Neill Forebay which would cause flooding in Stanislaus County.



INTENSITIES* FELT DURING SAN FRANCISCO EARTHQUAKE OF 1906

*MODIFIED MERCALLI SCALE OF 1931

CENTRAL CALIFORN
Stanislaus Area

0 10 20 30
MILES

Prepared by:
Stanislaus Area Association of Governments 1972

B - 32

- MAP #5

FIGURE #11

HISTORY OF EARTHQUAKES FELT IN THE STANISLAUS AREA

There has been one recorded significant eqrthquake in Stanislaus County in historical times. This earthquake had its epicenter in Del Puerto Canyon along the Telsa-Ortigalita fault zone. The earthquake had a magnitude of beyween 4.0 and 4.9 on the Richter scale. All other earthquakes listed below had epicenters outside of Stanislaus County.

DATE	INTENSITY IN STANISLAUS AREA	LOCATION OF EPICENTER AND REMARKS
5/2/1853	Felt - no details	Plains of San Joaquin Valley.
1/8/1857	Probably V-VI	Tehachapi Mountains.
12/26/1869	VI	California-Nevada border.
3/26/1872	V-VI	Owens Valley. The great Owens Valley Earthquake.
4/10/1881	VII	East of Stockton in Sierra foothills. Chimney and other damage in Modesto.
4/11/1885	V-VI	Nacimiento fault zone.
8/17/1896	Felt - no details	California.
6/20/1897	Felt - no details	Near Hollister.
7/6/1899	Felt - no details	Origin uncertain.
4/30/1900	III	Central coast region of California.
4/18/1906	VI-VIII	San Francisco Bay area. The great San Francisco earthquake.
7/18/1911	Felt - no details	Near Coyote.
5/28/1915	Felt - no details	Sierra Nevada.
3/10/1922	Felt - no details	San Andreas fault zone.
10/22/1926	IV	Pacific Ocean west of Monterey.
9/17/1927	Probably V	Bishop.
11/28/1928	III-IV	Near Independence.
11/28/1929	May have been felt	Northwest of Bishop.
4/9/1930	Very slight	Near Lake Tahoe.
12/20/1932	IV	Western Nevada.
5/16/1933	III	Southern Alameda County.
6/25/1933	IV	Western Nevada.
1/30/1934	III	Western Nevada.
12/3/1938	III	East Central California.
9/14/1941	III	Owens Valley.
10/25/1943	IV	Central California.
12/29/1948	IV	Near Verdi, Nevada.
3/9/1949	IV	37°01'N, 121°45'W.
3/13/1949	IV	" " " "
7/21/1952	VI	26 miles south of Bakersfield.
8/22/1952	I-III	Near Bakersfield.
7/6/1954	V	East of Fallon, Nevada.
7/23/1954	IV	East of Fallon, Nevada.
10/31/1954	III-IV	East of Merced.
12/16/1954	V	East of Fallon, Nevada.
4/1/1959	III-IV	California-Nevada border.
9/12/1966	IV-V	California-Nevada border.
10/17/89	III-IV (VII.I at center)	Loma Prieta Earthquake.

Source: U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration.

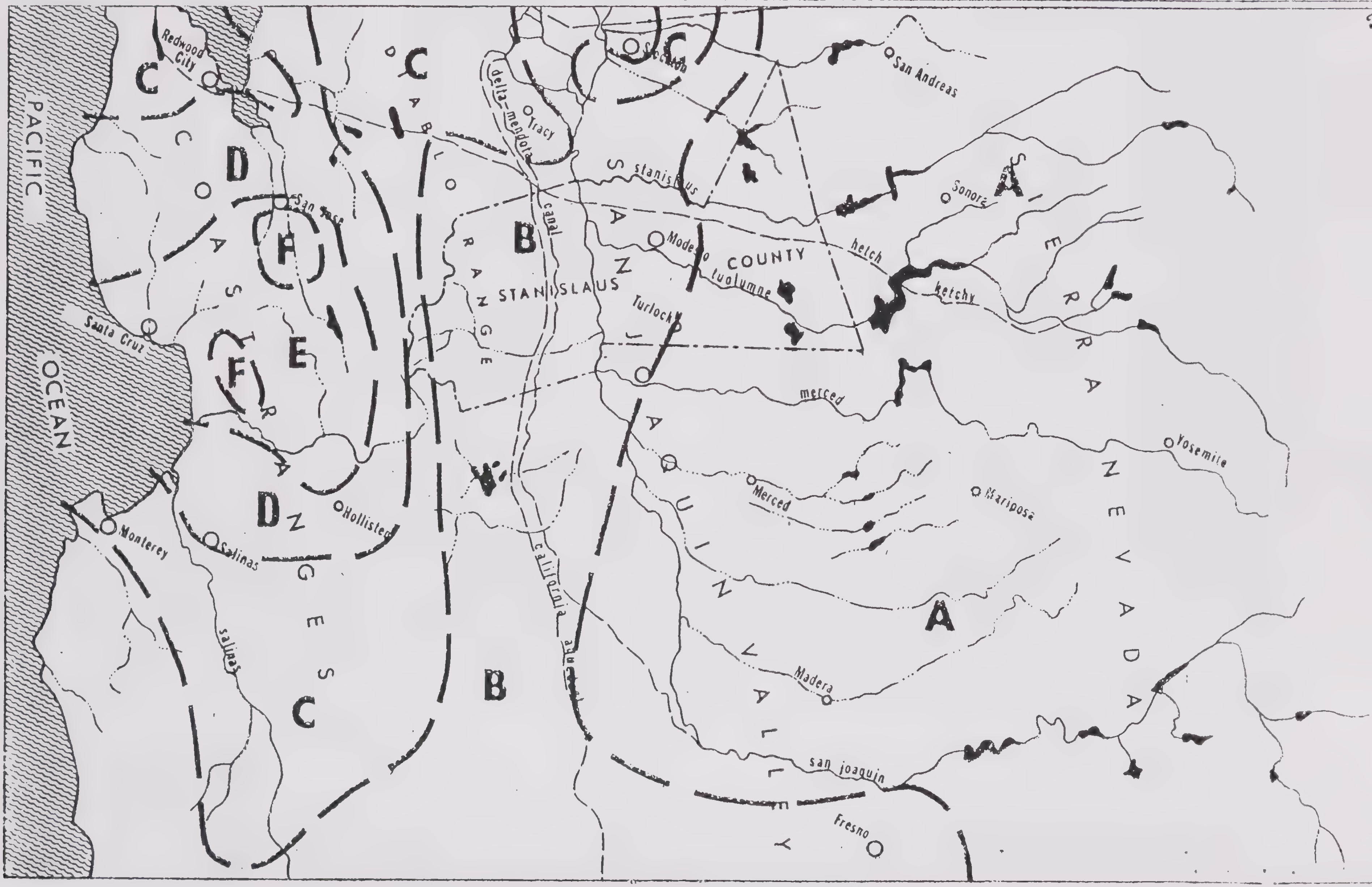
OCCURANCE OF EARTHQUAKE INTENSITIES
VI, VII OR VIII FROM 1810 TO 1969

A - 1 to 5
B - 6 to 10
C - 11 to 15
D - 16 to 20
E - 21 to 25
F - 26 to 30

CENTRAL CALIFORNIA
Stanislaus Area

0 10 20 30 40
MILES

Prepared by:
Stanislaus Area Association
of Governments 1972



1. The natural stability of slopes in the Diablo Mountains was discussed in the previous section on geologic hazards. It was found that the entire area, and especially the Franciscan formation tend to be highly unstable. Landslides, both young and old, are very common in all tectonically brecciated rocks. When related to excavations, landslides are common on the dip slopes of many unbrecciated sediments.

2. Geological investigations indicate that the most recent movements along the Tesla-Ortigalita fault took place in the Pliocene, more than five million years ago. However, earthquake activity unaccompanied by surface fracturing and faulting is still common along the zone. Since 1930, one earthquake epicenter of a magnitude greater than 4.0 was recorded along the fault line in Stanislaus County. Future earthquakes of similar or greater magnitudes are expected.

3. Numerous earthquakes occur every year along the San Andreas, Calaveras, Hayward and Nacimiento faults. The probable maximum intensity that would occur in the Diablo Mountains as a result of a high magnitude earthquake along one of these fault zones is VIII. Damage to structures from such an intensity could be severe.

4. The San Luis Reservoir in the Diablo Mountains of Merced County has a storage capacity of two million acre-feet. It is an earthfill dam. The reservoir is situated over the Tesla-Ortigalita fault zone. Part of the reservoir is underlain by sediments of the Franciscan formation. Most of the remainder is underlain by sediments of the Great Valley sequence. The dam itself is built upon sediments of the Great Valley sequence and upon Pliocene-Pleistocene alluvial sediments. O'Neill Forebay, with a storage capacity of sedimentary rocks, mostly Cenozoic alluvial sediments.

   These dams were designed prior to the measurement of higher ground motion in the San Fernando Valley earthquake and along the San Andreas fault. At the time of design, knowledge of the process a seismic liquefaction, as it applies to earthfill dams, was incomplete. The possibility of dam failure with resulting floods should be acknowledged.

As was dramatically demonstrated in the Alaskan earthquake of 1964, landsliding caused by earthquakes in a water-saturated terrain can be disasterous. Such sliding, resulting from the liquefaction of water-saturated sediments, might pose a severe problem if the Diablo Mountains suffered a severe earthquake during the wet season. The possibility of damage by earthquake induced landslides and ground shaking, makes the Diablo Mountains potentially the most hazardous area in Stanislaus County. Flooding as a result of dam failure in the Diablo Mountains poses a potential threat to life and property in an undetermined area adjacent to the San Joaquin River.

This examination of the evidence of seismic activity in Stanislaus County warrants the conclusion that earthquakes potentially threaten life and property throughout Stanislaus County. Local government needs to respond to this threat.

Emergency Preparation

In the light of the above evidence, the Stanislaus County Civil Defense Emergency Plans were examined to assess their effectiveness in the case of a "probable maximum intensity" earthquake. Revised state standards for emergency planning were issued in 1968 which recognize more fully the preparations required for earthquake disasters. In 1970 Stanislaus County revised its plan to conform to State standards. The objectives of the plan are:

1. Save lives and protect property.

2. Provide a basis for direction and control of emergency operations.

3. Provide for the continuity of government.

4. Repair and restore essential systems and services.

5. Provide for the protection, use and distribution of remaining resources.

6. Coordinate operations with the civil defense emergency operations of other jurisdictions.

Assessment of the plan in meeting these objectives in relation to seismic hazards resulting in the following conclusions:

1. The Civil Defense Emergency Plans in Stanislaus County are adequate in the eventuality of ground shaking induced structural damage for all of Stanislaus County as presently populated.

2. If land uses other than agriculture, recreation and public utility lines are permitted in the Diablo Mountains, revisions in the plans will be required to reflect seismic and other hazards.

3. Emergency communication centers, fire stations and other emergency service facilities should be examined as to their earthquake resistant capacities. If found below acceptable standards, a program should be adopted to bring these facilities up to standards within a reasonable time.

4. When maps showing flooding due to dam failure become available, the plans should be re-examined and changed where necessary.

Existing and Future Structural Hazards

Most injuries, loss of life and property damage during earthquakes result from structural failures. Architects and engineers over the past 20 years have emphasized the development of basic theories for understanding how earthquake forces affect buildings, the response of structures to these affects, and the design and technology needed to reduce the seismic risk. These problems are yet to be fully understood, and research continues.

Building codes are the primary tool governments possess to reduce seismic risk in structures. The basic philosophy behind the Uniform Building Code, which has been adopted by Stanislaus County and all of its cities, appears in the Recommended Lateral Force Requirements and Commentary by the Seismology Committee of the Structural Engineers Association of California. It states that the code intends buildings to

> Resist major earthquakes of the intensity or severity of the strongest experienced in California, without collapse, but with some structural as well as nonstructural damage... In most structures it is expected that structural damage, even in a major earthquake, could be limited to repairable damage.

In most cases, the earthquake provisions of a building code and the architect's and engineer's judgement determines the seismic risk of a new structure. A commonly accepted viewpoint by architects and engineers on seismic risk is to minimize life hazard, and to restrict property damage to reasonable limits in the event of a major earthquake.

All new buildings in Stanislaus County are being built under the seismic requirements of the Uniform Building Code, 1970 edition. This code places all of the County in seismic risk zone 2. In this zone, all structures must be designed to resist collapse in an earthquake of intensity VII on the Modified Mercalli Intensity Scale of 1931. The 1973 edition of the Uniform Building Code will place all of California in risk zone 3, meaning that all new structures must be designed to resist collapse in an intensity VIII earthquake. As was noted before, most of Stanislaus County can expect an intensity VIII earthquake.

Older structures were generally not built to withstand the lateral stress imposed by the ground shaking of a major earthquake. Generally speaking, the older the structure (except possibly simple single story wood frame structures), the less likely it is to resist an earthquake. This statement applies particularly to buildings having walls of non-reinforced brick held together by sand-lime mortar, but in general to all multi-storied buildings that do not have steel reinforcing. The seismic resistance of each building, however, must be determined individually (see figure #12 for Hazard Comparison of Non-Earthquake-Resistive Buildings).

As in new structures, the principle means at the disposal of government to reduce seismic risk in older structures is through building codes. The Dangerous Building Code, which is Volume IV of the Uniform Building Code, 1970 Edition, defines procedures for determining acceptable risk in older structures. Without detailing engineering principles, this code basically defines a dangerous building as any building that has any supporting part, member or portion less than 66 percent of the strength required by law in the case of newly constructed buildings.

Enforcing this code has economic and political repercussions. In the City of Modesto, it is probable that most multi-storied and non-reinforced masonry buildings constructed before 1933 could not meet code standards. Modesto, which has adopted the Dangerous Building Code, has taken a realistic and orderly approach to the problem. A 25 square block downtown area in the oldest part of the city has been selected for the first phase of a planned investigation that will eventually cover all buildings considered potentially dangerous in the city. Each building is carefully examined. If it does not meet Dangerous Building Code standards, the owner is given the choice of rehabilitation or clearance. Adequate time is given the owner to finance the reconstruction. The 25 square block area investigation will take four years to complete. It is an example of a well designed plan for safety that could be followed by all governments in seismically hazardous areas.

In Stanislaus County, all local governments have adopted the Uniform Building Code, 1988 edition. Volume IV, the Dangerous Building Code, has been adopted by Stanislaus County, Modesto, Ceres, and Riverbank. Turlock is working under its own dangerous building code. Waterford, Oakdale, Newman, and Patterson have no dangerous building code.

California's Field Act was adopted after the disasterous Long Beach earthquake in 1933 and applies to public schools. It has set the highest standards for earthquake safety of any law-enforcing agency. Communication centers and fire stations, while essential to emergency action following a damaging earthquake, are not included under the Field Act.

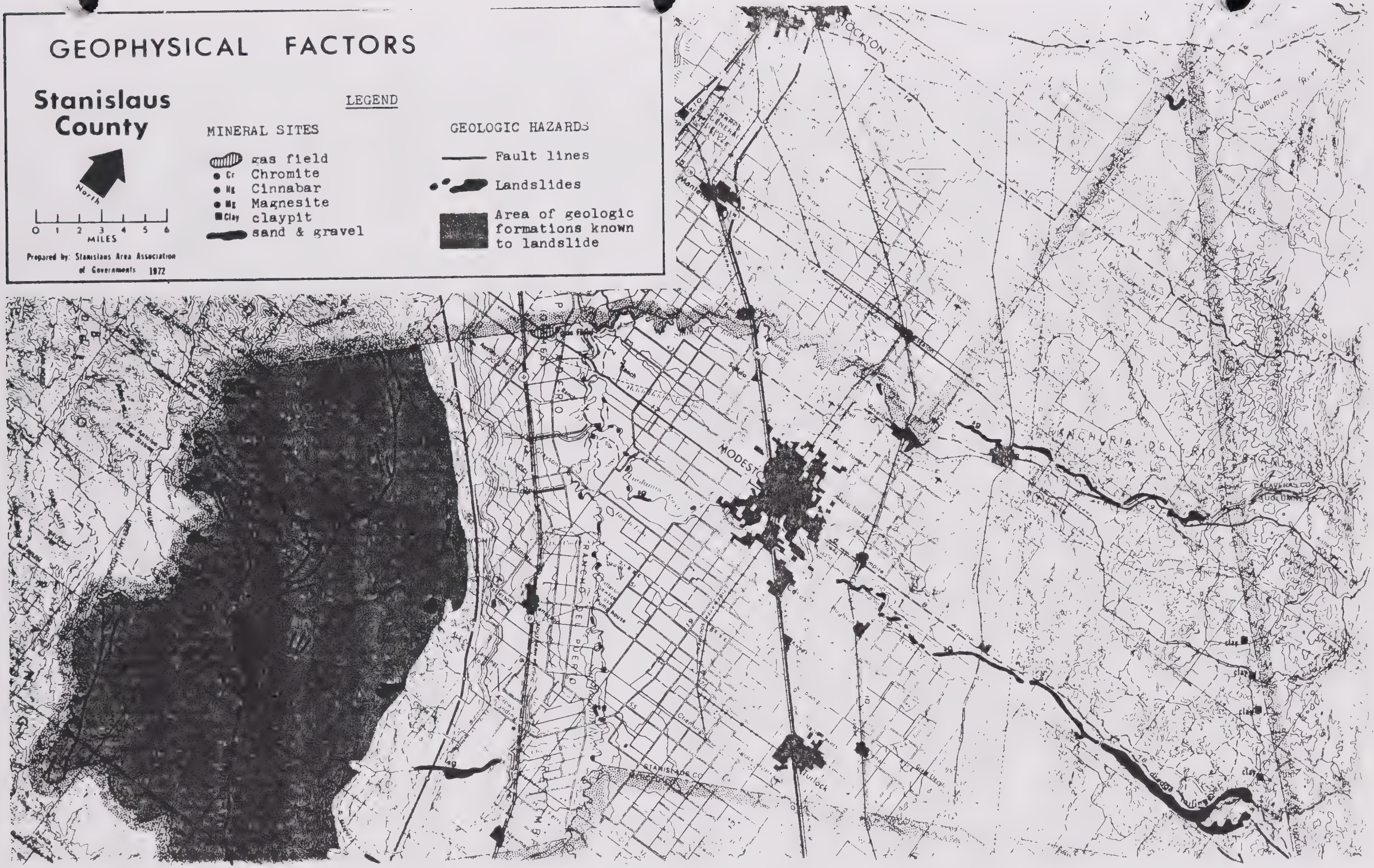
FIGURE #12

HAZARD COMPARISON OF NON-EARTHQUAKE-RESISTIVE BUILDINGS

This table is intended for buildings not containing earthquake bracing, and in general, is applicable to most older construction. Unfavorable foundation conditions and/or dangerous roof tanks can increase the earthquake hazard greatly.

SIMPLIFIED DESCRIPTION OF STRUCTURAL TYPE	RELATIVE DAMAGEABILITY (in order of increasing susceptability to damage)
Small wood-frame structures, i.e. dwellings not over 3,000 sq. fett and not over 3 stories..................	1
Single or multistory steel-frame buildings with concrete exterior walls, concrete floors, and concrete roof. Moderate wall openings.................................	1.5
Single or multistory reinforced-contrete buildings with concrete exterior walls, concrete falls, and concrete roof. Moderate wall openings..........................	2
Large area wood-frame buildings and other wood frame buildings..	3 to 4
Single or multistory steel-frame buildings with unreinforced masonry exterior wall panels; concrete floors and concrete roof...............................	4
Single or multistory reinforced-concrete frame buildings with unreinforced masonry exterior wall panels, concrete floors and concrete roof..............	5
Reinforced concrete bearing walls with supported floors and roof of any material (usually wood)..........	5
Buildings with unreinforced brick masonry having sand-lime mortar; and with supported floors and roof of any material (usually wood).........................	7 up
Bearing walls of unreinforced adobe, unreinforced hollow concrete block, or unreinforced hollow clay tile..	Collapse hazard in moderate shocks

Source: Abridged from Pacific Fire Rating Bureau Tariff Rules


GEOPHYSICAL FACTORS
Stanislaus County
North
0 1 2 3 4 5 6
MILES
Prepared by: Stanislaus Area Association of Governments 1972
LEGEND
MINERAL SITES
gas field
Cr Chromite
Hg Cinnabar
Mg Magnesite
Clay claypit
sand & gravel
GEOLOGIC HAZARDS
Fault lines
Landslides
Area of geologic formations known to landslide
STOCKTON
clay

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APPENDIX C

Air Pollutant Readings for Stanislaus County

Table 4 - Carbon Monoxide Readings for Stanislaus County

Table 5 - Ozone Readings for Stanislaus County

Table 6 - Particulate Matter - 10 for Stanislaus County

CARBON MONOXIDE READINGS FOR STANISLAUS COUNTY

YEAR	# DAYS OVER 8-HOUR STANDARD	HIGHEST 8-HOUR AVERAGE
1973	4	11.2
1974	1	10.5
1975	6	12.0
1976	1	11.5
1977	1	11.9
1978	2	13.4
1979	2	10.8
1980	1	10.0
1981	1	11.8
1982	0	8.6
1983	0	6.9
1984	0	8.4
1985	2	11.0
1986	4	11.3
1987	0	8.8
1988*	0	

* PRELIMINARY DATA THROUGH SEPTEMBER 1988 OBTAINED FROM ARB

OZONE READINGS FOR STANISLAUS COUNTY

	OVER STATE STANDARD			OVER NATIONAL STANDARD	
YEAR	# DAYS	# HOURS	HIGH FOR YEAR	# DAYS	# HOURS
1978	80	414	20	39	121
1979	57	234	17	15	30
1980	22	56	14	2	2
1981	46	164	15	11	27
1982	37	88	11	0	0
1983	47	156	14	5	6
1984	25	64	16	13	34
1985	57	206	15	10	18
1986	42	132	13	2	2
1987	77	318	15	5	13
1988	55	219	14	4	8

* PRELIMINARY DATA THROUGH SEPTEMER 1988 OBTAINED FROM ARB

PM-10 (24-HR STANDARD)

YEAR	MODESTO HIGH	COUNTY HIGH	# SAMPLES OVER STATE	# SAMPLES OVER NAT.
1984	82	82	3	0
1985	124	124	18	0
1986	159	159	13	1
1987	140	163	23	1
1988*	175	175		

* PRELIMINARY DATA THROUGH SEPTEMBER 1988 OBTAINED FROM ARB

CITY OF CERES
NEGATIVE DECLARATION
FOR

FILE NUMBER(S): G.P.A. 90-02

PLANNING AREA: City Wide

NAME OF APPLICANT: City of Ceres ADDRESS OF PROJECT: City wide

ASSESSOR'S PARCEL NUMBER: N/A NEAREST ROAD INTERSECTION: N/A

☒ GENERAL PLAN AMENDMENT: ~~FROM~~ ______ TO Update the Ceres Safety Element

☐ TENTATIVE PARCEL MAP ☐ SUBDIVISION TO SPLIT ____ ACRES INTO ____ LOTS

SUBDIVISION (NAME) ______

☐ CONDITIONAL USE PERMIT TO ALLOW: ______

☐ ARCHITECTURAL REVIEW; PROJECT DESCRIPTION: ______

☐ PUBLIC WORKS PROJECT: ______

☐ OTHER: ______

REASONS THE PROJECT WILL NOT HAVE A SIGNIFICANT ENVIRONMENTAL IMPACT:

☒ No significant environmental concerns were identified during the Initial Study.

☐ Other: ______

NOTICE:

In accordance with the authority and criteria contained in the California Environmental Quality Act CEQA) State Guidelines, and City of Ceres Guidelines for the Implementation of CEQA, the Environmental Review Committee analyzed the project and determined that the project will not have a significant impact on the environment. Based on this finding, the Planning and Community Development Department hereby files this NEGATIVE DECLARATION. A period of 21 days from the date of filing of this negative declaration will be provided to enable public review of the project specifications and this document prior to action on the project by CITY OF CERES. A copy of the project specifications is on file in the City of Ceres Planning and Community Development Department, 2720 Second Street, Ceres, CA 95307.

Sections: 15205, 15206, 15070, 15071, 15072, 15073

Miguel A. Galvez
PREPARED BY

August 16, 1990
DATE

ACHMENTS: Initial Study, Mitigation Measures

NOTE: Public review will be 30 days when projects are within the scope of Sections 15205, 15206, and 15073(b), (c), (d).

Posted August 16, 1990

EXHIBIT C

NEGDEC

NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN: That the Planning Commission of the City of Ceres will hold a public hearing on Monday, October 1, 1990 at 7:15 P.M. or as soon thereafter as may be heard, in the Ceres City Council Chambers, 2210 Magnolia Avenue, Ceres, California. This hearing will be to consider the following:

1) General Plan Amendment Number 90-02; A Proposal to Update and Adopt the Safety Element for the City of Ceres and Its Sphere of Influence, Deleting the Seismic Safety and Safety Elements. City of Ceres, Applicant. Negative Declaration Filed.

A negative declaration filed by the Planning Department may be reviewed at the Planning and Community Development Department, 2220 Magnolia Avenue, Ceres, California during normal business hours.

All interested persons should appear and be heard.

This notice is being given pursuant to the provisions of the Government Code of the State of California, Sections 65353 and 65355, local ordinance, and 15073 of CEQA Guidelines.

Jake Raper

JAKE RAPER, Director of
Planning and Community Development

PUBLISH: September 7, 1990 CC
PH101

EXHIBIT D

SAFETY ELEMENT GOALS
EXHIBIT E

PROPOSED SAFETY GOALS

Goal I

To prevent and reduce the loss of life, injury or damage to property resulting from fire.

Goal II

To provide adequate access for fire fighting and other emergency equipment.

Goal III

To assess storm flow flooding conditions that can pose significant hazards to life and property and to develop policies and standards to assure the protection of the public health, safety and general welfare.

Goal IV

To provide safe buildings for people to occupy. To prevent the loss of lives, injury, and property damage due to the collapse of buildings.

Goal V

To prevent the loss of lives, injury, and property damage due to the collapse of critical facilities and to prevent disruption of essential services.

Goal VI

To recognize existing and potential seismic and geological hazards to the community and implement programs to reduce potential impacts.

Goal VII

Reduce the potential for loss of life and property in Ceres from airplane accidents.

Goal VIII

Maintain a police force with a minimum ratio of 1.6 to 2 sworn officers for each 1,000 residents, deployed so that, in an emergency situation, all areas of the city can be reached by police officers within five minutes.

Goal IX

Reduce the risk and fear of crime through physical planning strategies that will maximize surveillance opportunities and minimize opportunities for crime found in the present and future built environment, and by creating and maintaining a high level of community awareness and support of crime prevention.

Goal X

Promote land use patterns that reduce daily automotive trip distance for work, shopping, school, and recreation.

Goal XI

Promote to the greatest extent possible, safe driving surfaces.

Goal XII

Protect life and property from the potential short-term and long-term deleterious effects of the necessary transportation, use and storage of hazardous materials within the City of Ceres.

Goal XIII

It is the goal of the City of Ceres to promote and encourage the protection of the valley's water supply to assure the availability of clean and healthful drinking water in quantities sufficient to meet the domestic, industrial and fire flows.

Goal XIV

To ensure the protection of the public health, safety and welfare from conditions of steep slopes and areas subject to erosion which pose significant hazards to life or property.

Goal XV

To ensure that city emergency procedures and resources are adequate in the event of the occurrence of natural or man-induced disasters.

Goal XVI

To protect the city and its residents from the threat of loss of life and property from natural and man-induced hazards through the provision of adequate levels of service and public awareness.

Goal XVII

The city should establish a redevelopment agency to assist in the recovery and redevelopment of areas affected by a disaster.

Goal XVIII

The city shall closely coordinate the goals and policies of this Seismic and Safety Element with those of the Land Use, Open Space, Conservation, and other related elements of the Ceres General Plan.

Goal XIX

To promote and encourage the protection and wise utilization of the San Joaquin Valley's air quality to assure long term availability of clean and healthful air.

Stanislaus Cou ıty
Department of Environmental Resources
Air Pollution Control District

1716 Morgan Road
Modesto, California 95351
(209) 525-4152

AUG 13 1990
CERES P.D. & C.D.

August 6, 1990

Jake Raper
City of Ceres
Department of Planning and Community Development
P. O. Box 217
Ceres, CA 95307

RE: General Plan Amendment 90-02; Update of the Safety Element for the Ceres General Plan.

The Stanislaus County Air Pollution Control District endorses **Goal X** of the proposed Safety Element. A reduction in automotive trips and trip distances through the mixed-use concept would result in a corresponding decrease in the air pollutants emitted by mobile sources.

The APCD also agrees with **Goal XIX** "*To promote and encourage the protection and wise utilization of the San Joaquin Valley's air quality to assure long term availability of clean healthful air.*" Preserving and improving air quality requires recognition that land-use and development policies do have an effect on air quality. The six policies you describe to achieve **Goal XIX** are good ones, however in Policy 6 we believe you should include the Stanislaus County Air Pollution Control District along with SAAG and CARB.

Air pollution should be included in **Table 1** (Environmental Risk Assessment Framework) on page 16. Stanislaus County has been designated as a nonattainment area for carbon monoxide, ozone and PM10 (particulate matter 10 microns or less). This designation is a result of the County's and the San Joaquin Valley's failure to meet both the state and federal government health standards for these three pollutants. The **Potential of Occurrence** of unhealthful air pollution is high. The **Scope of Risk** is local, city-wide and regional. The **Event Duration** could be short term or long term.

Section IV(J)(4) on page 46 spells out the local response to increased air pollution. This proposed response is to continue implementation of the transportation tactics of the 1982 *Stanislaus Air Quality Plan*. The response should also include implementation and compliance with the policies proposed under Goals X and XIX.

Thank you for the opportunity to comment, if you have any questions please call me at 525-4152.

David L. Jones

DAVID L. JONES
AIR POLLUTION CONTROL SPECIALIST

EXHIBIT F

AUG - 8 1990

CERES P.D. & C.D.

CITY of MODESTO

Public Works & Transportation Department: 801 11th Street, P. O. Box 642, Modesto, CA 95353

Administration: (209) 577-5213 [TDD (209) 526-9211 Hearing and Speech Impaired only]

July 11, 1990

Mr. Miguel Galvez, Planning Aide
Planning and Community Development
City of Ceres
P.O. Box 217
Ceres, CA 95307-0217

Dear Mr. Galvez:

SUBJECT: General Plan Amendment 90-02; Update of the Safety Element of the Ceres General Plan.

The City of Modesto's Public Works and Transportation Department has completed a review of the City of Ceres' General Plan Safety Element and provides the following comments.

It appears that the proposed Safety Element recognizes only property areas within the airport's approach and transitional zones as potential areas for disaster from aircraft accidents. We encourage the City of Ceres to identify all airport overflight areas as having higher risk for loss of life.

The report is correct in stating that the loss of life from aircraft accidents can be reduced when compatible land use is exercised around airports. Therefore, we suggest that all properties within both the Airport Overlay Zone and the aircraft overflight areas be identified as high risk areas where residential use should be discouraged.

Thank you for the opportunity to comment. For more information, please contact Airport Manager, Howard Cook, at 577-5318.

Sincerely,

Van W. Switzer

Van W. Switzer
Acting Director

VWS:JR:dm

STATE OF CALIFORNIA GEORGE DEUKMEJIAN, Governor

GOVERNOR'S OFFICE OF EMERGENCY SERVICES
REGION IV
9845 HORN ROAD, SUITE 150
SACRAMENTO, CALIFORNIA 95827
916/366-5341
FAX: 916/366-5349

OES CALIFORNIA
California Office of Emergency Services

AUG - 7 1990
CERES P.D. & C.D.

August 6, 1990

City of Ceres
Planning and Community Development
P.O. Box 217
Ceres, CA 95307-0217

Attention: Miguel Galvez
Planning Guide

Dear Mr. Galvez:

I have reviewed the draft Safety Element portion of your General Plan. The Safety Element more than identifies hazards which may affect the City of Ceres.

I will assume that you have reviewed Mr. Jim Martin's letter of July 20th. Since Mr. Martin and I reviewed the Safety Element document together, I concur with the areas Mr. Martin has identified that need to be addressed before going final with the General Plan.

In addition, referencing the history of Figure 11 Page B-33, **Earthquakes felt in Stanislaus County**, the last reference made was 9/12/66. If this figure is going to be used in your final Plan, it should be up-dated to include the **Loma Prieta Earthquake** of 10/17/89.

If you have any questions, or if I can be of further assistance, please contact me.

Sincerely,

ORRIN ORR, Regional Manager
Region IV

OEO:is

cc: Jim Martin, Stanislaus County

EXHIBIT F

Don Pedro Dam and Powerhouse

TURLOCK IRRIGATION DISTRICT
333 EAST CANAL DRIVE
POST OFFICE BOX 949
TURLOCK, CALIFORNIA 95381
(209) 883-8300

RECEIVED
JUL 20 1990
CERES P.D. & C.D.

July 11, 1990

City of Ceres
P.O. Box 217
Ceres, CA 95307-0217

Gentlemen:

Reference: General Plan Amendment 90-02; Update of the Safety Element of the Ceres General Plan
TID Application No. M90-113

The following comments concerning this project are from the T.I.D. Irrigation System only:

The T.I.D. Irrigation System has no comment concerning this project.

Thank you for giving us the opportunity to comment on this project.

Sincerely,

TURLOCK IRRIGATION DISTRICT

Brent D. Harrison

Brent D. Harrison
Civil Engineering Department Manager

BDH:dp:M90-113

xc: Russ DeLuca

TID

EXHIBIT F

LAFCO

S T A N I S L A U S
LOCAL AGENCY FORMATION COMMISSION
1100 H STREET MODESTO, CALIFORNIA 95354
(209) 525-7660

July 26, 1990

JUL 30 1990

Miguel Galvez, Planning Aide
Department of Planning and Community Development
City of Ceres
P. O. Box 217
Ceres, CA 95307-0217

RE: Safety Element Update

Dear Mr. Galvez:

Thank you for the opportunity to comment on the proposed update of the Safety Element. The draft document discusses the issue of fire safety and gives a very brief description of the Ceres Fire Protection District. As you are aware, as lands are annexed to the City they are simultaneously detached from a fire protection district. The affected districts include the: Industrial, Westport and Ceres Fire Protection Districts. In order to aid the reader/user of the Element, it is suggested that a discussion of how fire protection service in the territory located outside of the city boundary, but within the City's sphere of influence, is provided. This discussion could include some of the problems to the City of providing service, especially in urbanized areas, such non-existent or undersized water lines, or incompatible fire hydrants.

The adopted LAFCO Sphere of Influence (SOI) for the City includes a specific policy regarding special districts located within the SOI. This policy states:

> 3. Where all of a special district or a substantial portion of a special district is within the City's primary area of influence, the City will be encouraged to develop annexation policies which will anticipate the total inclusion of the district's territory rather than a portion so as not to impose an unbearable tax burden upon the citizens within the balance of the district's territory.

From the map provided, it appears the Ceres and Industrial Fire Protection Districts would be severely impacted by annexation/detachment. In addition, the Westport Fire Protection District may also be affected. It is urged that the City in the Safety Element work with these districts to resolve this issue to each entity's satisfaction.

EXHIBIT F

If you have any questions regarding my comments, please contact me.

Sincerely,

Ron E. Freitas

Ron E. Freitas
Assistant Executive Officer

REF:sbw, L16

cc: Ceres Fire Protection District
Westport Fire Protection District
Industrial Fire Protection District

EXHIBIT F

Stanislaus County
Office of Emergency Services
1200 G Street, Suite C
P.O. Box 233
Modesto,Ca. 95353
(209) 525-6453

JUL 24 1990
CERES P.D. & C.D.

July 20, 1990

Mr. Miguel Galvez
Planning Aide
Planning & Community Development
P.O. Box 217
Ceres, CA 95307-0217

Subject: General Plan Amendment 90-02; Update of the Safety Element of the Ceres General Plan.

Sir,

The State Office of Emergency Services, Region IV, manager, Mr. Orrin Orr, referred your General Plan Safety Element to me for comment and response.

First let me inform you I am charged with developing county-wide (including cities) emergency plans for coordinating response to major disasters within the county and cities.

I have reviewed your Safety Element and find it to be a very complex but detailed document. There are a few areas that need to be changed or reviewed. They are as follows:

1. Page 25. First line - "County Safety Administrator" should be changed to "County Deputy Director, Office of Emergency Services". The Deputy Director, OES and Safety Coordinator are the same person and works out of the Chief Administrators Office. I am that person and on matters of disaster planning I wear the OES hat.

2. An inconsistency exists:
   Page 42 - Last paragraph, first line. The city's Multi-Hazard Functional Plan was adopted in October 1988 instead of 1986.

   Page 47. V SAFETY PROGRAMS

   A. Emergency Services Operational Plan

      First paragraph, last sentence. "The city of Ceres Multi-Hazard Functional Plan was adopted by the City Council on February 14, 1977 by Resolution No. 77-33"?? I don't believe this is correct. Should be 1988 Resolution # I'm not sure.

EXHIBIT F

3. Inundation Area: Don Pedro Dam (Map 2)

My office has received a new Emergency Action Plan (EAP) for Don Pedro Dam. This new plan was developed by a consultant for T.I.D. and I have not had the time to review the material in detail. I will tell you, there is a significant difference in the inundation boundaries that will require a relook at our evacuation plans and studies.

This new information shows a total inundation of the City of Ceres to what depths I don't know. That information is in the EAP and must be extracted.

I will be happy to meet with you to discuss the above and provide whatever information I can.

Please call.

Sincerely,

James A. Martin

James A. Martin
Deputy Director

JAM:mp
cc: Orrin Orr, State OES Region IV

EXHIBIT F

Stanislaus Cou..ty

Department of Planning and Community Development

1100 H STREET MODESTO, CALIFORNIA 95354 PHONE: (209) 525-6330 FAX: 525-6507

August 28, 1990

RECEIVED
AUG 30 1990
CERES P.D. & C.D.

Mr. Miguel Galvez, Planning Aide
Planning and Community Development
City of Ceres
P.O. Box 217
Ceres, CA 95307-0217

RE: Update of the Safety Element of the Ceres General Plan

Dear Mr. Galvez:

Thank you for the opportunity to review the proposed update of the Safety Element of the Ceres General Plan.

The County is mainly concerned with those sections of the Safety Element that affect the Modesto City-County Airport. As noted on page 35, the approach and take-off patterns for aircraft using this facility intersect portions of the Ceres sphere of influence. This airport approach corridor should be considered a critical area because it is subjected to frequent low overflights and greater exposure to risks to public health and safety.

Instead, it appears that the Mitchell Road Corridor Specific Plan designates a large portion of that airport approach corridor for Mixed Use (Residential, Business Park, Recreational). The Mixed Use designation allows hotels, motels, churches and other uses that are incompatible with airport approach corridors and prohibited by the Airport Land Use Commission Plan.

To allow the development of hotels, motels, churches and other uses that involve concentrations of people in an area subject to known risks to public safety seems inconsistent with Policy 1 under Goal VII, which states:

> Ensure proper planning around the Modesto City-County Airport in conjunction with the City of Ceres, to assure compatible land uses and adequate safety requirements.

Consistency with this Safety Element policy and the policies of the Airport Land Use Commission Plan are critical to maintaining the safe operation of the Modesto City-County Airport and protecting the people and structures in its environs.

Sincerely,

Leslie Hopper

Leslie Hopper,
Associate Planner

EXHIBIT F

U.C. BERKELEY LIBRARIES
C124907740

Stanislaus County

Department of Planning and
Community Development

August 29, 1989

RECEIVED
AUG 30 1989
CERES P. & C.D.

Mr. Miguel Galvez, Planning [illegible]
Planning and Community Development
City of Ceres
P.O. Box 217
Ceres, CA 95307-0217

RE: Update of the Safety Element of the Ceres General Plan

Dear Mr. Galvez:

Thank you for the opportunity to review the proposed update of the Safety Element of the Ceres General Plan.

The County is mostly concerned with those sections of the Safety Element that affect the Modesto City-County Airport. As noted on page [illegible], the approach and take-off patterns for aircraft using this facility intersect portions of the Ceres sphere of influence. This aircraft approach corridor should be considered a critical high [illegible] because it [illegible] need to prevent [illegible] and [illegible] hazards to [illegible] public health and safety.

Instead, it appears that the [illegible] Land Use [illegible] Plan designates a large portion of that airport corridor [illegible] for [illegible] commercial, [illegible]. [illegible] the designation allows hotels, motels, churches and other uses that are incompatible with airport approach corridors and prohibited by the Airport Land Use Commission Plan.

To allow the development of hotels, motels, churches and other uses that involve concentrations of people in an area adjacent to known zones of public safety seems inconsistent with Policy 1 under Goal III, which states:

- Ensure proper planning around the Modesto City-County Airport in cooperation with the City of Ceres, to ensure compatible land uses and adequate safety requirements.

Consistency with this Safety Element policy and the policies of the Airport Land Use Commission Plan are critical to maintaining the safe operation of the Modesto City-County Airport and protecting the people and structures in its environs.

Sincerely,

Leslie Hagen,
Associate Planner